Digital Gerrymandering

Near-future pessimistic scenario
Electoral districts have long been shaped and manipulated to the benefit or disadvantage of certain political parties, and as network connectivity becomes a major factor affecting citizens' quality of life, access to resources, and even the ability to vote, the practice of gerrymandering is translated to the digital realm. Building on the tactics of traditional gerrymandering, some districts are "packed"—incumbent politicians strategically place high-speed internet in a select few districts to consolidate constituents of the opposing party in fewer locales, minimizing their presence in contested districts and thus weakening their ability to sway elections. Other districts, where constituents of the opposing are already concentrated, are "cracked"—incumbent politicians throttle connectivity or undermine the installation and maintenance of network infrastructure in order to disperse their opponents' voters, diluting their electoral impact. No politician will give up the opportunity to gain an advantage over their rivals, and weaponizing connectivity is a clever (if sinister) way to do just that.
KEY INSIGHT
In the digital age, a nation’s technology capabilities are inextricably linked to its economic prosperity, national security, and social stability. Technology shapes the ways the countries relate to one another, and it influences the global balance of power.

EXAMPLES
A great decoupling is underway, as the U.S. and Chinese tech sectors are cleaved apart by national governments. What began as a rift in the semiconductor, cloud, 5G, AI, and biotech industries has bled into other sectors, deepening existing business and economic divides. In the past year, the COVID-19 pandemic only further magnified the ideological differences in political freedoms and human rights, wealth distribution, and the role of the state in everyday life.

DISRUPTIVE IMPACT
China’s new Foreign Investment Law imposes strict rules for vetting foreign investments on national security concerns. Widely seen as retaliation for the Trump administration’s aggressive blacklisting of Chinese companies, the law’s intent resembles that of the Committee on Foreign Investment in the United States, which wielded great power under Trump and cut Chinese investment from U.S. businesses. Companies must decide whether to remove supply chains from China and how to safeguard company and consumer data if it is housed on Chinese servers. Brands must weigh the marketing value of a viral TikTok video with the risk that accompanies the platform’s strong Chinese Communist Party ties. Meanwhile, WeChat and Huawei increase China’s influence around the world. As the globe’s two largest economies drift apart, companies must navigate business interests and relationships with lawmakers.

EMERGING PLAYERS
• U.S. Department of State
• Committee on Foreign Investment in the United States
• China’s Ministry of Commerce
• China’s National Development and Reform Commission
• China’s Foreign Investment Law
**KEY INSIGHT**

The founding promise of the digital world was broad connectivity where information could flow freely. But as some governments take steps to filter (or completely block) access to the internet and subscription models make wealth a prerequisite for access to reliable information, we’re headed toward a fragmented future with “splinternets” rather than a single world wide web.

**EXAMPLES**

Nation-scale internet censorship is most closely associated with China’s “great firewall.” The Chinese government aggressively monitors the internet and removes information that doesn’t meet its political standards. At times of political unrest, as during widespread riots in Xinjiang in 2009, China has completely shut down access to the internet. China’s leadership believes its model contributes to stability—and is open to exporting that approach to the rest of the world: “We should respect the right of individual countries to independently choose their own path of cyber-development,” said Chinese President Xi Jinping at China’s second World Internet Conference in 2015. Splinternets aren’t just the product of blocking free access to the internet; sometimes it’s enough to just increase the barriers to finding reliable information. That can be a technical roadblock—as in a censorship regime that doesn’t remove websites, but knows the average user won’t have the knowledge or time to connect through a virtual private network (VPN) to reach unfiltered information—or a financial one.

**DISRUPTIVE IMPACT**

The playbook for governments dealing with social unrest increasingly includes trying to disrupt the digital tools activists use to organize. If it becomes clear that leaders can follow that playbook with impunity, look for it to be increasingly adopted by democratic governments. Early this year, Myanmar’s military shut down the internet as thousands of citizens tried to organize a rally against the coup that had taken over the government. Even VPNs couldn’t bypass the blackout. India shut down phone and internet services to protesters several times in 2020, and instituted new bans in February to de-escalate protests.

**EMERGING PLAYERS**

- Freedom House
- Amnesty International
- Access Now
1ST YEAR ON THE LIST

Vaccine Nationalism

KEY INSIGHT

While options for effective COVID-19 vaccines emerged by late 2020, capacity met only a fraction of the global demand. Weak cooperation between businesses and countries caused an imbalance over which citizens got access to the vaccine.

EXAMPLES

In 2020, wealthy nations pre-ordered vaccine doses from companies within their preferred trading blocs, and with production unable to keep up with demand, that left dozens of developing economies without a means to protect their citizens. By the middle of January 2021, only 25 doses of the vaccine had been administered in emerging markets. (That’s not a typo.) In wealthy nations, 39 million had been administered. Those 25 doses were Russia’s Sputnik vaccine, and they were given to people in Guinea.

DISRUPTIVE IMPACT

At a virtual meeting of the World Economic Forum in January 2021, South African President Cyril Ramaphosa pleaded with wealthy nations to share their doses. As he gave his speech, a dangerous coronavirus mutation known as 501Y.V2 was spreading: It seemed to be more transmissible, and possibly more resistant to antibody therapies. And it emerged in South Africa. We risk splitting our countries, and our communities, into biological haves and have-nots. Covax, a vaccine sharing fund, began offering its first doses in February, but it still had to compete with nations such as the U.K. and U.S. that could afford higher prices to secure what limited supplies were available. The director-general of the World Health Organization warned of a “catastrophic moral failure” if rich nations continued to hoard doses.

EMERGING PLAYERS

- World Health Organization
- Covax

We risk cleaving our countries, and our communities, into biological haves and have-nots.
Vaccine Passports

KEY INSIGHT
Different countries began requiring proof of a COVID-19 vaccine at borders in 2021. Big tech companies are working to build digital identification systems that function as vaccine passports.

EXAMPLES
Restaurants, sports arenas, entertainment facilities, and tourist destinations continue to bleed money with Covid lockdowns; tourism-dependent countries are understandably eager to reopen their borders. Several countries, including Romania, Cyprus, and Seychelles, lifted quarantine restrictions for travelers with proof of inoculation. The United Nations World Tourism Organization called for the global adoption of vaccination passports using a single standard, not unlike traditional passports that allow people to travel between borders.

DISRUPTIVE IMPACT
Several vaccine passport systems are underway. The Geneva-based Common Trust Network, a project supported by the World Economic Forum, developed a secure mobile app that lets users upload official Covid test results and proof of vaccination. The app generates a QR code with a health certificate to be shown to authorities without revealing personal information. Partners include U.S. health systems and several airlines (United Airlines, JetBlue, Lufthansa, Swiss International Air Lines, Cathay Pacific, Virgin Atlantic). IBM developed the Digital Health Pass, an adaptation of a digital wallet. Companies can customize the criteria required for entry (proof of vaccination, as well as Covid tests and other biometrics). Because competing credentialing systems will be a problem, the COVID-19 Credentials Initiative is working to develop a set of common standards for vaccine passports.

EMERGING PLAYERS
• Linux Foundation Public Health
• COVID-19 Credentials Initiative
• Clear
• CommonPass
• IBM
• United Nations World Tourism Organization

Tech companies such as IBM are developing digital vaccine passports or mobile wallets for test results.
City-Scale Digital Twins

KEY INSIGHT
Cities are using digital twins of themselves to model the interplay of real-world infrastructure, topography, movement, and population. The result: better management in the real world.

EXAMPLES
Building on cities’ traditional modeling tools, these digital twins draw on data from intelligent buildings, vehicles, and infrastructure to help decision-makers play out a variety of scenarios. They can prepare emergency management for events like floods and power outages, and they can assess the impact of a construction project, such as the shadow it casts on nearby properties or how it affects traffic flow. The first digital twin city, Virtual Singapore, locates areas that need better mobile data coverage, models barrier-free routes for people with disabilities, and identifies buildings ideal for solar panel installations. Sydney made its digital twin an open-source platform to better plan for land development.

DISRUPTIVE IMPACT
As cities worldwide develop digital twins, they will combine historically siloed and buggy datasets from many sources. As a result, city government vendor contracts will shift further toward data aggregation, cleaning, management, and analytics. Digital twins will eventually take over micro-decisions from city government, such as snowplow routing. Companies building artificial intelligence systems to predict, plan for, and respond to urban needs will see successes, as cities seek to streamline operations in perpetually budget-strained environments. Autonomous vehicle companies and buildings will enjoy the benefits of more and better data, such as 4D maps. Likewise, insurance companies will be further empowered to pinpoint risk areas based on intricate prediction models. Privacy concerns around using data that can identify individuals may limit the scope of some predictions.

EMERGING PLAYERS
• National Research Foundation, Prime Minister’s Office, Singapore
• Arup Group
• Siemens
• Taisei
• Dassault Systèmes

City-scale digital twins will shape our future urban landscapes.
KEY INSIGHT

U.S. states are developing charters and special permissions to stimulate blockchain use for digital identification, cryptocurrencies, and managing digital assets.

EXAMPLES

In 2020, Wyoming became the first state to approve a banking charter for digital assets when it approved applications by Kraken (a consumer-focused cryptocurrency exchange) and Avanti Bank & Trust (a bank created to hold crypto for institutions) to form the first two special purpose depository institutions (SPDIs) in the world. The SPDI permit enables institutions to take deposits and offer custody and fiduciary services for digital assets. All this came to fruition just one year after Wyoming passed legislation to allow SPDI charters. The state’s Division of Banking granted permission to Two Ocean Trust, a wealth management services firm, to provide custodial services for digital assets. In November, the University of Wyoming launched its Center for Blockchain and Digital Innovation, signaling a growing trend in the state.

DISRUPTIVE IMPACT

In 2015, Kraken and other crypto companies ceased operations in New York after the rollout of strict regulations. Governments that create burdensome regulations around crypto may find that industry players and the opportunity they bring may leave for greener pastures. That said, federal regulations could nullify state and municipal efforts. The states are eager to court startups, so new policies and regulations favoring blockchain initiatives are likely in 2021. Miami Mayor Francis Suarez, who launched a Twitter campaign at the end of 2020 pitching the city as the next center for fintech innovation, met with crypto industry leaders and explored a Miami-based Gemini LATAM headquarters with founders Tyler and Cameron Winklevoss.

EMERGING PLAYERS

• Avanti Bank founder Caitlin Long
• Wyoming Gov. Mark Gordon
• U.S. Sen. Cynthia Lummis (R-Wyo.)
• Andrew Yang
• Miami Mayor Francis Suarez

Wyoming legislators have been key in promoting a friendly regulatory environment toward crypto.
1ST YEAR ON THE LIST

State Laws for Facial Recognition

KEY INSIGHT
States are developing local laws for facial recognition technology and its use in law enforcement.

EXAMPLES
In early 2020, New Jersey Attorney General Gurbir Grewal directed all police departments to cease the use of Clearview AI, a controversial facial recognition tool. Despite questions around accuracy, collection methodologies, and privacy rights, Clearview reportedly built a database of more than 3 billion photos scraped from the likes of Facebook and Venmo. Later in the year, a New Jersey man sued a local police department after a facial recognition tool mistakenly linked him to a shoplifting case and he spent 10 days in jail. A similar situation unfolded in Michigan, after police wrongly arrested a Black man due to mistaken facial recognition. A growing body of research found consistent inaccuracy when facial recognition algorithms attempt to identify females, people of color, and younger people.

DISRUPTIVE IMPACT
While lawmakers introduce legislation to curb the use of facial recognition, infrastructure for the technology grows by the second as users upload photos and video to TikTok, Instagram, and other social platforms. Technology companies are aware of the problem: Last summer Microsoft and IBM banned the police use of their technologies, and Amazon placed a one year moratorium on police use of its Rekognition tool. However, facial recognition technology did aid in arrests made following the Jan. 6, 2021, U.S. Capitol riot. Lawmakers must grapple with privacy rights and unauthorized collection of data, as well as with the technology’s effectiveness in law enforcement.

EMERGING PLAYERS
- New Jersey Attorney General Gurbir Grewal
- New York State Sen. Brad Hoylman
- U.S. Sen. Ed Markey (D-Mass.)
- U.S. Department of Justice
- American Civil Liberties Union

As the infrastructure for facial recognition technology expands, questions around unfettered surveillance remain.
KEY INSIGHT
Throughout history, multilateral efforts have resulted in nations working together to promote shared purposes. Proposals to create multilateral initiatives on artificial intelligence, genomic editing, and blockchain are currently being discussed.

EXAMPLES
Multilateral agreements between sovereign nations resulted in the Geneva Conventions, League of Nations, International Monetary Fund, United Nations, and World Health Organization. Now, following revelations that a pair of genetically engineered twin girls was born in China, some wonder whether international norms are enough. As many fields of science and technology produce striking new developments, lawmakers, researchers, and ethicists are calling for some kind of consensus—and international deliberations that could lead to international treaties and protocols.

DISRUPTIVE IMPACT
COVID-19 has been a stress test of current cooperative relationships worldwide. Throughout 2021, the outcome of vaccine distribution will result in vaccine nationalism or multilateralism, and that will have downstream effects on other key areas of science and technology—CRISPR, ocean plastics, climate, autonomous vehicles, AI, and space exploration—for years to come.

EMERGING PLAYERS
• International Union of Biological Sciences
• United Nations
• World Health Organization
**Digital Dividends**

**KEY INSIGHT**

A digital dividend would give citizens a cut of the profits derived from their personal data.

**EXAMPLES**

Proponents of an unconditional guaranteed income for everyone within a country argue that it would be a means of encouraging entrepreneurial innovation and that it would help offset the effects of automation, advanced robotics, and artificial intelligence on the market for human labor. California Gov. Gavin Newsom proposed a digital dividend that would allow state residents to share in the profits of big tech companies. There are already city-scale experimental universal basic income (UBI) programs running in Oakland and Stockton, California. The Stockton project initially gave 125 randomly selected low income families $500 a month for 18 months; recipients spent the money on utility bills, credit card debt, groceries, and dental work. The program, deemed successful, was extended into 2021.

**DISRUPTIVE IMPACT**

With rising unemployment and financial loss, COVID-19 gave UBI programs new momentum. Germany launched a new UBI program in August 2020 similar to the Stockton experiment: 120 Germans are receiving 1,200 euros ($1,430) every month for three years. Researchers are comparing the UBI group with a control group not receiving basic income, to determine the impact on everyday life. Spain launched a UBI program for its lowest-income families and is distributing 1,015 euros ($1,145) to those in need. Kenya’s UBI program, the largest and longest-running UBI experiment in the world, is five years into a 12-year experiment period. More than 20,000 people receive monthly payments, no strings attached.

**EMERGING PLAYERS**

- Centre for Public Impact
- GiveDirectly
- California
- German Institute for Economic Research
- Renda Básica de Cidadania program in Brazil
- Stanford Center on Philanthropy and Civil Society

A UBI program in Maricá, Brazil, launched in 2015.