

U W M G 2 0    2 0 1 8

TECHNOLOGICAL  
EVOLUTION:

**challenging  
horizons**

# INTRODUCTION

*“In many ways, we are our greatest technological constraint. The slow and steady march of human evolution has fallen out of step with technological progress: evolution occurs on millennial time scales, whereas processing power doubles roughly every other year.”<sup>1</sup>*

These are the words of data journalist Nate Silver, whose has made a career on an uncanny ability to work in harmony with technology to extract the maximum value from oft-problematic data sets. It is an age old truth that those who are able to adapt to change most successfully are those who will thrive. In the information age, the axiom has taken on new meaning, as the Bezos', Gates' and Buffetts of the world continue to thrive based on their understanding and creative applications, of new technology.

As Silver points out, technological turnover continues to build momentum at an ever-faster pace, and the societies that engineer its rise are left grappling with its less-savoury side effects. Entirely new fields of creation, like fintech and AI are uprooting long-standing norms of the ways in which corporations, governments, and citizens interact with one another. To try to predict upcoming technological advancement is a nearly impossible task, meaning that governments are left playing catch-up to regulate and understand the issues that accompany it.

As technology continues to progress, the G20 nations will play a key role in its development and proliferation. As 20 of the wealthiest, most educated nations in the world, most emerging technologies will be created by, and consumed by their citizens. Governmental policies will determine who receives the education necessary to create them, the leeway companies are given to create, and ultimately the fate of technologies themselves.

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<sup>1</sup> Nate Silver, *The Signal and the Noise: Why So Many Predictions Fail- But Some Don't*. (New York: The Penguin Press, 2012), 292.

TOPIC 1  
**economic  
impact**

SECTION 1A:  
AUTOMATION

SECTION 1B:  
FINANCE

## SECTION 1A: AUTOMATION

### *Introduction*

Automation is the use of machinery or other technology to perform a task or provide a service traditionally done by human labor. Many have attempted to calm fears of automation, including the US Executive Office of the President, which estimated that “every 3 months about 6 percent of jobs are destroyed by [automation], while a slightly larger percentage of jobs are added ... the economy has repeatedly proven itself capable of handling this scale of change.”<sup>2</sup> On the flip side, the nonpartisan World Economic Forum has estimated that the global workforce might lose 5.1 million jobs before 2020, with 7.1 million jobs destroyed and just 2 million created by automation.<sup>3</sup>

Among those who hold automation as a major concern and those who dismiss these fears, opinions are subjective. There is no way of knowing what the coming years may hold for the workforce or the machines which may soon replace large chunks of it. Seeing as estimates range so wildly, those who claim to know what the future holds should be heard with skepticism. It does prove useful, however, to theorize on the types of effects automation may drive, particularly with a historical lens through which to view the situation.

### *Background*

As machines take on roles traditionally done by human labour, one of the major considerations is of its effects on the job market. One of the more immediate concerns is that corporations will opt for automated machinery rather than human labor to complete unskilled and skilled tasks alike, in order to improve efficiency in terms of both time and money. The potential for automation as a disruptive force in the job market is concentrated in fields involving many repetitive tasks, and requiring little human connection. Among many others, jobs subject to automation include manufacturing, construction, customer service, and even accounting.

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<sup>2</sup> United States of America, Executive Office of the President, *Artificial Intelligence, Automation, and the Economy*, accessed July 2018, [https://www.whitehouse.gov/sites/whitehouse.gov/files/images/EMBARGOED\\_AI\\_Economy\\_Report.pdf](https://www.whitehouse.gov/sites/whitehouse.gov/files/images/EMBARGOED_AI_Economy_Report.pdf).

<sup>3</sup> *The Future of Jobs*, report, World Economic Forum, accessed July 2018, <http://reports.weforum.org/future-of-jobs-2016/employment-trends/>.

In respect to all this coming change, some experts believe that it will cause a societal crisis as jobs become scarce and the gap between the wealthy and the poor widens. Their intellectual opposition would suggest that this is a typical overreaction to the ongoing progression of technology, no different than the cries of the luddites who feared that the machines of the industrial revolution would render man obsolete. The argument is that as traditional jobs are occupied by machine, new jobs will be created. In the period of the industrial revolution, which serves as a useful precedent for the coming “automation revolution”, traditionally labour intensive jobs were made easier by machine, but new jobs were created as European economies ballooned. The economic expansion allowed for more factories to be built, and therefore more jobs to be created operating the new machinery. Likewise, those who see concerns about automation as unfounded believe that new jobs will fill in gaps in the job market. A modern example of this is of McDonald’s cashiers being replaced by self-service kiosks. As cashier positions are removed, more staff is added to help customers navigate the touch-screen replacements. In this sense, it is reasonable to believe that a job crisis can be averted as new roles are created.

### *The Issues*

Among arguments for the dismissal of concerns about automation is the suggestion that while automation removes some demand for human workers, it also lowers the cost for related services. This potential outcome would increase demand to the point that more people would be employed in the long run. A relevant example of this is the introduction of automatic tellers at banks, which reduced the number of human tellers needed at each branch but led to a 43% increase in the total number of branches.<sup>4</sup> In this case study, more tellers were employed in the long run, thanks to the efficiencies of automation.

The hole in theories such as these is that regardless of whether jobs are eventually replaced, there is nonetheless a period of hardship and inequality as the world waits on the potential of new job creation. This is one effect noted about the Industrial Revolution. Economic historian Gregory Clark estimates that real wages in England fell by about 10 percent from 1770 to 1810, and took about 60 or 70 years of

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<sup>4</sup> Karen Lachtanski. “Automation is Expected to Create Jobs but Only You Can Make Sure You Get One.” *Entrepreneur*, March 2, 2018.

transition for any wage gains to take place.<sup>5</sup> In any such grand shift in the workforce, economic uncertainty will loom over many a household worldwide.

As some of the largest developed economies in the world, G20 countries will generally be among the most protected from automation-related job loss. In general, the most developed countries have the lowest risk of automation, due to their high concentration of skilled, and non-repetitive jobs. Middle-income and developing countries are far more susceptible to automation, as a high percentage of their workforces are dedicated to easily automated roles.<sup>6</sup> Beyond these realities, many in developed nations have the means to retrain themselves should their livelihoods be threatened. This is not the case in low and middle-income countries, as their populations have far less significant savings to fall back on should they be necessary. This does not exempt the G20 nations from the threat of automation, however. Middle-income countries in the G20, such as Mexico and Indonesia, make up a significant portion of global trade, and large-scale job loss in those regions will have an impact on all of their G20 allies.

## Major Players

### South Korea

Due to strong education & retraining programs, it is ranked the best-prepared country for automation by the Economist Intelligence Unit (EIU). It has the potential to share this model with other G20 countries, but only if those countries accept the utility of such programs in the first place, and are willing to make the sizeable investments to their infrastructure.

### Germany

In order to preserve the health of the economy in the long term, Germany has begun heavily investing in programs that guard against the uglier side-effects of

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<sup>5</sup> Gregory Clark, “The Condition of the Working Class in England, 1209-2004” (University of California Davis, 2005).

<sup>6</sup> *Digital Dividends*. The World Bank (Washington, DC), 121.

automation. It is currently operating based on the concepts of 'Lifelong Learning' & employment insurance to fund skills upgrading.

### China

Although many low-skill jobs have moved from North America and Europe to India and China, resulting in an enormous increase in these countries' GDPs,<sup>7</sup> these same jobs are now at risk of being automated. As the country with the largest labour force in the world, China will have to determine how to prepare its citizens for the potential loss of these jobs.

### United States

According to a study by the software firm Intuit, automation will lead to 40% of American workers becoming independent contractors in the volatile 'gig economy' by the year 2020.<sup>8</sup> A 2017 report confirmed these numbers, and suggested that over 50% of the workforce will be freelancing by 2027.<sup>9</sup> This is likely to lead to increased class divide between those who control the means of automation and those who work in the gig economy.

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## GOALS OF A COMMUNIQUE

1. How can G20 countries work to protect their workforces without disrupting the march of technological progress?
2. How can a balance be struck between overreaction and negligence, when the outcomes of the automation revolution are impossible to predict?
3. What responsibility do G20 countries have for protecting their more vulnerable peers from economic fallout, if any?

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<sup>7</sup> "GDP per Capita of China and India," digital image, Wikimedia Commons, December 15, 2014, accessed July 2018, [https://commons.wikimedia.org/wiki/File:GDP\\_per\\_capita\\_of\\_China\\_and\\_India.svg](https://commons.wikimedia.org/wiki/File:GDP_per_capita_of_China_and_India.svg).

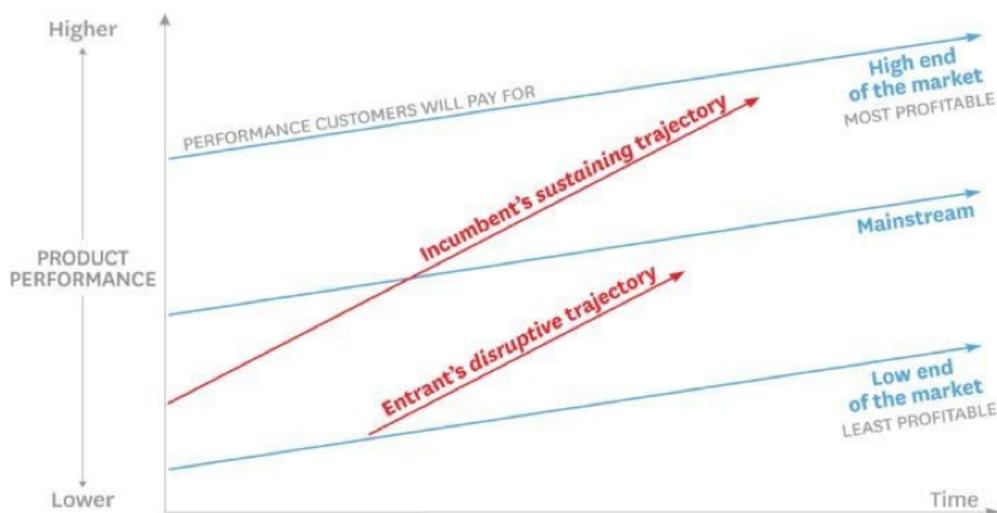
<sup>8</sup> *Intuit 2020 Report*, report, Intuit, October 2010, accessed July 2018, [https://http-download.intuit.com/http.intuit/CMO/intuit/futureofsmallbusiness/intuit\\_2020\\_report.pdf](https://http-download.intuit.com/http.intuit/CMO/intuit/futureofsmallbusiness/intuit_2020_report.pdf).

<sup>9</sup> *Freelancing in America 2017*, report, Upwork, accessed July 2018, <https://www.upwork.com/i/freelancing-in-america/2017/>.

## SECTION 1B: FINANCE

### Introduction

Many of us likely still remember the atmosphere of movie rental shops, with their poster-covered walls and racks of neatly ordered DVDs. At its peak in 2004, Blockbuster, one of the largest video-rental companies, had approximately 9,100 stores<sup>10</sup>. Currently that number is down to three.<sup>11</sup> Blockbuster isn't alone in this tumble. In the first decade of the 2000s, the video rental industry collapsed due to a disruptive innovation. The rise of video-streaming services like Netflix and Hulu wiped out the previously existing industry, taking down several corporate behemoths with it.



SOURCE CLAYTON M. CHRISTENSEN, MICHAEL RAYNOR, AND RORY MCDONALD  
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<sup>10</sup> Blockbuster, 2004 Form 10-K, 1

<sup>11</sup> Annie Zak, "After This Closure, Alaska Will Have 2 of the 3 Remaining Blockbusters in the U.S.," *Anchorage Daily News*, May 15, 2018, accessed July 2018, <https://www.adn.com/business-economy/2018/05/15/after-this-closure-alaska-will-have-only-2-blockbuster-stores/>.

Disruptions of existing markets through new, innovative ideas and technology have always been a threat, but the frequency of new businesses taking long-undisturbed markets by storm has swollen since the beginning of the information age, as evinced by the corporate catchphrase, “Disrupt or be disrupted.” However, according to the creator of the term disruption, Clayton Christensen, true disruption is still rare, and widespread misinformation about the way disruption takes place often hurts businesses that attempt to make a market in such a way. Incumbent companies in a market, such as Blockbuster, traditionally focus on the higher end of the market, where profitability is highest. As a result, they usually over-cater and oversupply to high-end customer’s needs and under-cater to low-end customer’s needs, leaving a large segment of the market underserved or unserved. True disruptive innovation begins on the fringes, serving this segment of low-end customers that incumbent companies are not interested in reaching: in the case of Netflix, its original online mail-order format meant that it was not of interest to people who wanted popular new releases, or same-day purchase and viewing. These customers were still served by Blockbuster, and were unable to be served by Netflix.

However, technological innovations such as online video streaming improved Netflix’s performance, allowing it to move from the fringes of the industry to the mainstream. Because it was now capable of offering instant, high-quality access to movies without customers having to travel to a physical location, it became an attractive alternative to the high-end customers that Blockbuster had previously catered to. As the graph above shows, Netflix, and other video-streaming services, began at the underserved bottom end of the market and moved towards the top, eventually taking up a larger market share than movie-rental companies and forcing them out of business.

Video-streaming technology is a true disruptive innovation because it eliminated the market for movie rentals, and created a new market in its place. However, Uber, another industry-displacing business facilitated by new technology, is not an example of disruptive innovation despite being widely hailed as such. Uber did not begin by appealing to underserved segments of the market: it was founded in San Francisco, which has widespread taxi use, and was primarily designed for customers already using taxis. It has certainly run many established taxi companies into the ground, and has made mobile ride-hailing services more accessible, but it has not

actually changed the market significantly. At its core, there is no difference in customer between Uber and a traditional taxi company. The difference is in how the service is delivered. Uber, then, is what is known as a sustaining innovation: an improvement on an existing market that nevertheless does not significantly alter that market.<sup>12</sup>

Although the terms ‘technological disruption’ and ‘disruptive innovation’ have slightly different meanings, they are often used in tandem. Often, the catalyst for a fringe company to move into the mainstream market is some variety of technological innovation that allows it to offer a better or cheaper service. True disruptions are made possible through technological innovation, as the table below shows:

| Year  | Innovation            | Disrupted market | Notes   |
|-------|-----------------------|------------------|---|
| 1870s | <b>Telephone</b>      | Telegraph        | Western Union was originally offered the telephone patent for \$10,000 but declined, as it was short-distance and their clientele was primarily long-distance. Subsequent innovations made the long-distance telephone viable.                                  |
| 1920s | <b>Automobiles</b>    | Rail transport   | Although automobiles were invented in 1885, they were seen as high-end luxury goods: Ransom Old & Henry Ford’s mass production methods made them affordable to the general public and enabled disruption.   |
| 1990s | <b>Digital photos</b> | Chemical photos  | Digital photography was developed in the 1950s, but was inferior in quality to chemical photography. Tech improvement and miniaturization made them a cheaper, viable alternative and opened the market to non-photographers.                                   |
| 2007  | <b>iPhone</b>         | Computers        | Prior to the development of the iPhone, desktop and laptop computers were the most popular ways to connect to the Internet: today, almost double the amount of Americans that own laptops own cellphones, with computers being reserved for more complex tasks. |

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<sup>12</sup> Clayton M. Christensen, Michael Raynor, and Rory McDonald, "What Is Disruptive Innovation?" *Harvard Business Review*, December 2015.

Financial technology is advancing at an unprecedented rate, leading to new opportunities - and new risks - for established banks. As the economic system of most G20 countries is reliant on a handful of large, well-established banks, it is in their best interests to examine technological disruption within the financial sphere and how best to accommodate it. If this path is not taken, economic disaster is a potential outcome, seeing as these few large banks have such a major role in these established economies.

At the same time, it is important not to inhibit the growth of new technologies, for they are potential drivers of national, and global economies. Excessive regulation, or ineffective modes of regulation, run the risk of holding back new industries. This is easy to see in the distinctions between technology hubs from each country to another.

### *Background*

Although banks have always experimented with technological innovation, the rate of progress today is threatening to redefine the modern banking system as we know it. Online banking has reduced the need for brick-and-mortar branches, while opening up the possibility of third-party services that provide everything from a centralized banking platform to automated investment advising. This in turn opens up the possibility of cybercrime, and the need for financial cybersecurity. According to PricewaterhouseCooper's 2016 Global CEO Survey, 81% of banking CEOs rank the speed of technological change as a top concern.<sup>13</sup>

Finance is the backbone industry that holds modern economies together. When it fails, as was the case in 2008, it can sink entire economies. Never before has the industry seen a period of such rapid growth, and as such, governments must be agile in order to maintain relevant regulations that will allow new technologies to flourish, while protecting banking customers from the most harmful of possible effects.

### Issues

Many banks have legacy systems in place that make it difficult for them to respond to these new challenges rapidly and proactively, as they follow a sustaining-

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<sup>13</sup> Suzanne Snowden and Poh-Khim Cheah, "19th Annual Global CEO Survey," PriceWaterhouseCooper, January 2016, accessed July 2018, <https://www.pwc.com/gx/en/ceo-survey/2016/landing-page/pwc-19th-annual-global-ceo-survey.pdf>.

innovation business practice as incumbents in order to cater to their most-profitable customers: as a result, are losing some market share to smaller, more agile competitors that are able to do similar tasks, but in a cheaper, more user-friendly way. The central banks of G20 countries are able to control the money supply, interest rate and more by relying on a small group of large, well-established banks to interface directly with. Unregulated progress in fintech could lead to a massive reshuffling of this relationship, which if not properly handled could have significant repercussions for G20 and global economies. The existence of a global currency not tied to any country or government, for example, would mean that monetary policy could no longer be implemented in the traditional way and that innovative new methods of ensuring financial stability would be required to maintain sustainability.

It is a well-documented truth that poorly regulated banking systems are often the root of financial mayhem, as was the case during the Great Depression and the 2008 financial crisis. In order to prevent catastrophes like these, it is necessary that countries move forward on regulatory solutions that will hold organizations accountable for the financial transactions they make. Seeing as the abilities and operations of fintech companies differ from those of traditional banking systems, differently laws are required to regulate them uniquely. This is pertinent to G20 discussions, as financial crises in individual countries often have global consequences. A relevant issue for all G20 nations is the ability to tax corporations that no longer require a large scale physical presence. In many cases, digital companies make the majority of their profits outside of the countries from which they are headquartered, which upsets the balance of private profit and tax revenues within individual countries. In order to combat this, the EU recently implemented laws which will allow member states to tax corporations based on the profits made within those nations, rather than geographic location alone.<sup>14</sup> The tax laws also allow for the taxation of extraordinarily profitable corporations on certain online revenues, for example those earned via digital advertisements.

Within the realm of finance, an important technology to consider is the automated trading system. Algorithms with set rules that determine whether to buy or sell stocks have all but replaced the chaotic, manual trading that was formerly a

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<sup>14</sup> Selva Ozelli, "Latest Pronouncements from OECD, EU & G20 Allow Fintech to Flourish: Expert Take," *Coin Telegraph*, March 26, 2018.

mainstay on the floors of stock exchanges worldwide. These algorithms react to a range of influences, acting far more quickly than a human trader could ever be expected to. The problem with this high-frequency trading is that the algorithms are often trained to find patterns in minute detail, but incapable of the human element which is crucial to moderating markets. Experts warn that the technology leads to “extremely higher market volatility.”<sup>15</sup> This subsequently “raises concerns about the stability and health of the financial markets,”<sup>16</sup> an ever-pressing issue for G20 nations. In order to ensure the stability of the markets, regulations, limits, or some other type of protection may be necessary.

## Major Players

### United Kingdom

Having established a cryptoassets task force in order to promote fintech companies, the government believes “regulation could be an enabler”<sup>17</sup> to financial prosperity through the new technologies. Disruptions of traditional financial institutions through the Brexit process may also provide opportunities for innovation.

### China

A leading developer of fintech, 5 of the largest 10 companies in the field are Chinese. This stems mainly from high rates of technological literacy, as well as less strict regulation than other G20 countries. China’s cooperation will be integral in the implementation of a fully updated agreement on the role of fintech in the economy of the future.

### United States

Home to almost 60% of fintech companies worldwide, the US is nevertheless behind

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<sup>15</sup> Usman Chohan, “The Real Problem with High-Frequency Trading,” *Business Insider*, January 31, 2016.

<sup>16</sup> *Ibid.*

<sup>17</sup> Oscar Williams-Grut, “City Minister: There Could Be ‘A Stable, Flourishing Cryptocurrency Exchange in London’ with the Right Regulation,” *Business Insider*, March 23, 2018, accessed July 2018, <https://www.businessinsider.com/city-minister-john-glen-cryptocurrency-regulation-2018-3>.

many other G20 countries in terms of fintech recognition and regulation, which is severely limiting the sector's potential. Government cooperation is critical to allowing the segment to thrive in a way that aligns with the goals of the state.

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## GOALS OF A COMMUNIQUE

1. How can governments ensure that public financial institutions remain stable as private fintech corporations grow in prevalence?
2. What measures must be put in place to ensure that digital financial systems are protected from the threat of attack that so often plagues technology-based businesses.
3. What role, if any, do governments play in regulating cryptocurrencies and the organizations that disperse them?

# TOPIC 2

# social change

SECTION 2A:  
CONNECTIVITY

SECTION 2B:  
DATA RIGHTS

## SECTION 2A: CONNECTIVITY

### *Introduction*

Since the dawn of the World Wide Web in 1990, technology has been advancing and spreading around the globe at an astonishing rate. Part of this speed is thanks to the internet itself. Today, information can be taught and learned by people across the globe faster than ever before, and the limits of our knowledge have consequently been expanding in an unprecedented fashion. Following in the footsteps of the internet, much of the new knowledge being pursued is centered around new methods of connecting people with one another.

A prime example of this is the concept of smart cities. These high-tech population centers are changing the way cities function by driving efficiency, prioritizing public safety, and reworking transportation systems. By using sensors and trackers to better understand where the city could improve, smart cities leverage the power of connectivity to drive results.

The range of technological disruption taking place is particularly intense in wealthy nations such as those in the G20. In response to these changes, the forum should consider the potential consequences of a rapidly changing societal and environmental system.

### *Background*

Over the past decade, new solutions to old problems have been invented and spread to the point of ubiquity in rapid succession. Take for example the revolution of the iPhone. In 2007, Apple CEO Steve Jobs held a conference in which he introduced three new products: “a widescreen iPod with touch controls, a revolutionary mobile phone and a breakthrough internet communications device.” He then explained to an awestruck audience that he was not describing three separate products, but one, seemingly all powerful piece of technology. In one foul swoop, Apple had introduced to the world to the era of the smartphone. Over the following years, the Apple empire soared, and inspired a troupe of imitators looking to build an alternative, perhaps improving on the iPhone.

Smart cities are in a position similar to the one that phone companies were in the mid 2000s. The technology is present and ready to be used; it’s just waiting to be

spread to more cities. In order for this development to take place, a corporation may need to play the role of Apple and put all of the technologies together in an easily accessible format that cities can feel confident about investing in. Should this occur, smart technology could be used to increase mobility within the city, reduce the waste of resources, and limit the city's effects on the environment. All of these goals are intended to result in an improvement in quality of life for the population, in both the short and long-term.

### *The Issues*

Along with the corporations that are often behind groundbreaking technologies, the countries in which they are based play a huge role in the development and proliferation of technologies. Government policies are crucial to determining the ways in which companies organize and grow, as well as building the education systems that fosters the minds of young innovators.

As certain regions and countries consistently develop and implement new technologies before others, it becomes important to consider the roots of this discrepancy. A sizeable portion of the gap can be explained by education. Those who are consistently trained to perform well in subjects such as math and science are more likely to go on to create new technologies, and as such, are likely to spread those technologies to the areas around them. Among factors that affect educational opportunity are wealth, societal priorities, and gender. Many societies can simply not afford to send their youth through sufficient schooling to build skilled workforces, but in other cases students are held back from their potential due to less obvious barriers.

One of the most worrisome is the gap in educational opportunities and outcomes between young men and women. In many countries, women are resigned to their traditional household roles, while their male peers are given the opportunity to attend school and build their skill sets, on the path to becoming successful members of the workforce. This discrimination is not only problematic from a perspective concerned with human rights, but also from one concerned with economic efficiency. In cases where women are held back from opportunities that they are capable of, and that would help them contribute to the economy, half of the population is not being used to its full potential. Part of the success of merit-based societies focused on equality comes from the fact that those who are best suited to contribute new ideas regularly

earn the opportunity to do so, despite their personal identity. Even in progressive countries, however, women and girls are held back from achieving their potential in the fields of science, technology, engineering and math (STEM). Classes in these disciplines are overwhelmingly consumed by male students, despite efforts to encourage more women to pursue the subjects. As a result of this educational pipeline problem, jobs in STEM fields are largely occupied by men, and when new technologies are introduced and spread, it is often men who profit most.

At the same time that women are held back from the positions at the cutting edge of technology, in some cases entire societies are held back plainly because of their educational priorities. Through the latter half of the 20th century, the world watched as Japan experienced several distinct surges of innovation and technology, accompanied by economic boom. The reasons for the surges were rooted in Japan's post-World War Two focus on setting up technical schools where their young people would learn the skills necessary to bring about the technological change that drives the economy. Comparisons between the ways that math and science are taught in different countries demonstrate the ways in which government policy and curriculum affect students' interest in the fields, as well as their abilities to learn the concepts effectively.

Beyond educational issues, it is important to consider the initial disruptions that will occur due to the implementation of the technologies. In the case of Smart Cities, infrastructure must be built, populations must adapt to the new processes and interactions, and furthermore, must buy in to the developments. One of the most pressing problems that arises with smart cities is obtaining residents' participation. When developing a smart city, the inconveniences to residents that come along with each part of the process may be damaging to the reputation of the project, and some residents reject it entirely. When residents find issue with the project as a whole, it can be difficult to persuade them to adapt to new ways of life based on its implementation. In cases where the project is publicly funded, it may mean that the initiative doesn't get the public support necessary to go ahead with it.

It is also necessary to consider what the advancement of certain technologies will mean for the different groups that occupy a population center. While Smart Cities are nearly sure to improve quality of life among citizens, the distribution of benefits may exacerbate existing inequalities. In order for new technologies to be most effective, they will typically be installed in central parts of the city before they are

taken up in less populous areas. What this means is that those who can afford to live and work in prime real estate will be most positively affected by the technology, while those who cannot will be left behind. This issue is particularly concerning seen as the technology will likely be used to affect public health and safety outcomes. In the case where smart-city technology allows for emergency vehicles to get to their destinations faster, it is worrisome that those high-earners who occupy the central parts of the city will have better access to emergency help than their low-income counterparts.

Another issue surrounding the development of smart city technology is that many of the projects that occur in one city are irrelevant to another city. For example, the advancements in Songdo, South Korea may have nothing to do with those in Masdar, United Arab Emirates. Each city has its own goals that it hopes to accomplish via technology, and each will seek to do so in a unique way. Architects of smart cities must also consider that each city that attempts a smart city project will have a different climate, cultural norms, modes of transportation, and needs. In this sense, smart city technology is not as universally applicable as technologies such as the smartphone, nor can it be built upon and further developed in the same way as these other technologies can.

## Major Players

### United States

As the predominant global economy, and consumer of all things convenient, the United States has a large role to play in the development of smart cities and related technologies. The United States has a few smart city projects already in the works, and many companies seeking to reap the rewards of the new sub-industry. In fact, a recent report by the Eden Strategy Institute found that 12 of the top 50 smart cities in the world are in the United States, more than any other country on earth.<sup>18</sup>

### South Korea

The nation's attempt at a smart city, Songdo, seems to have turned out as an

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<sup>18</sup> Eden Strategy Institute, OXD, "Top 50 Smart City Governments," (report, Singapore, 2018).

unsuccessful attempt. The entire city is based on state of the art technology, from garbage disposal systems that suck trash straight from garbage cans to dumps, to ubiquitous video chat systems that allow you to speak to neighbors or attend college classes from afar. Despite this, Songdo is only a quarter full. It lacks the residents and the corporate presence needed to make it a world-class city, a phenomenon taking place thanks to the great expenses associated with living in such a high-tech city. In meeting with the G20 nations, it may have insights as to how cities must avoid the prohibitive expenses that can sometimes be associated with smart cities.

### Canada

Toronto's Sidewalk Labs is a great example of the concept of connectivity and the social changes associated with technological disruptions. It is one example of a project in which the corporation at the helm relies on the heavy use of personal data to inform decisions about how cities should operate. This tactic raises certain ethical questions.

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### GOALS OF A COMMUNIQUE

1. What degree of personal data collection is acceptable for private companies to engage in?
2. How can it be ensured that Smart technologies do not increase the gap in health and living standards between the wealthy and poor?
3. How can the global community encourage more women and girls to engage in STEM fields?

## SECTION 2B: DATA RIGHTS

### *Introduction*

Addressing the urgent problem of citizens' data privacy is essential today. It is a particularly pressing issue as technology becomes democratized. When technologies are first introduced, they are often adapted first by corporations, but as it becomes more accessible, private citizens join in its uptake. Today, the internet, computers, and smartphones are nearly ubiquitous among citizens of developed nations, and therefore the stakes are higher. Many consumers of these technologies are either oblivious to the risks of sharing their sensitive information online, or dismiss its potential for harm. Even those who are concerned about the safety of their data can often not afford to invest in strong safeguards, like wealthy corporations can. In this environment, people are at great risk of having their information stolen or corrupted.

With proposed regulations comes the collaboration of governments and corporations defining what is right for individuals of society. One example where the government has set regulations for data privacy is the European Union's General Data Protection Regulation (GDPR). The regulation sets the standards for data privacy among individuals, companies and organizations. Accordingly, it allows individuals to consent to what they want to be shared, and deny access to other information. The GDPR represents the most comprehensive legislation on data privacy to date.

### *Background*

Current G20 members like the U.S., Switzerland and especially the E.U. have set up legislation regulating an individual's data rights, and corporations' acceptable behavior within the agreement. These countries are minorities, however, in that most of their peers lag greatly on legislating the relationship between individuals, corporations, and data. These underprepared nations face issues concerning personal data, fair business practices, and even national security. G20 nations are at particular risk, due to the scale of their economies, and the pervasiveness of information technologies among their citizens.

Recent accusations against the Russian government for allegedly interfering in the 2016 American election are the root of new American sanctions, and subsequent tensions. Since the allegations of election-meddling, the Russian government was

found to have stolen classified NSA information from a government employee's personal computer.<sup>19</sup> With the security, and democratic processes of nations reportedly being compromised, addressing the prevalence of data-stealing hacks is an urgent matter of foreign policy. Sanctions against Russia in response to their hacking is an insignificant punishment for a purported attack on democracy, and the future of consequences for actions such as these is controversial. Clearer, and possibly stronger, legislation is needed against attacks that steal and change information.

### *The Issues*

The ever-improving technologies in today's world have an increasingly reliance, and dependence on data. In addition, there has been a larger amount of personal data available for collecting, transferring and sharing. With all the new data collection and movement, the question of privacy ethics may arise.

One example of benevolent technology allowing for a malicious application of data collection is Copenhagen's Green Wave. The Green Wave was created after the consideration of Copenhagen's large cyclist population and introducing traffic lights tailored to them. Essentially, "at a speed of 20 km/h, cyclists can surf a wave of green traffic lights through the city without putting a foot down."<sup>20</sup> The technology was created for the purpose of rewarding those who made the eco-friendly decision to use transportation powered by human energy, rather than fossil fuels. In practice, it means that data collected from advanced infrastructures and used to help with traffic management may be abused by allowing for the tracking of individuals. In the right hands, this data may be very effective in accomplishing social and environmental goals, but in the wrong hands it could be used for much darker purposes. Corporations gathering this data can analyze it to get a more specific idea of the lives of individuals. As well, the data collected by retail businesses and telecommunication providers may

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<sup>19</sup> Mallory Locklear, "Russian hackers reportedly stole NSA cyber defense material," Engadget (October 5, 2017).

<sup>20</sup> Lasse Lindholm and City of Copenhagen, "Cycling in Copenhagen - the Easy Way," Vitus Bering -The Official Website of Denmark, , accessed July 8, 2018. <http://denmark.dk/en/green-living/bicycle-culture/cycling-in-copenhagen---the-easy-way/>.

be “used to provide targeted services, advertisements, and offers to existing and prospective customers.”<sup>21</sup>

Another alarming consideration is the race for corporations to collect large amounts of data on their clientele. These organizations can take advantage of their positions of power, and knowledge about individuals, to further their business interests, with little regard for the privacy and quality of life of their clientele. Even more worrisome is that some companies have been victim to hacks that seek out the personal information of their clientele, notably credit card and identity information. In the hands of criminals, this information is even more dangerous, as it could be used to steal from, or otherwise take advantage of, victims.

Even beyond the collection of personal data by corporations, data breaches are a dangerous possibility. In October 2015, a man named Ardit Ferizi was sentenced to jail for 20 years by the U.S. Justice Department for stealing the personal data of over 1,300 U.S. government officials, including their phone numbers and email addresses, and sending it to members of ISIS to assist the planning of attacks against them.<sup>22</sup> ISIS published the information of these individuals and named them as the targets for attacks after receiving the information from Ferizi. Thankfully, no such attacks occurred. Nonetheless, the case is a pertinent example of the true dangers that can occur due to poor data protection.

## Major Players

### European Union

As discussed above, the E.U.’s General Data Protection Regulation (GDPR) is perhaps the most complete legislation regarding the protection of data and the consequences of its misuse. It was established as the essential modernization of the previous set of guidelines. As such, it follows the principles of the set and includes sections for new

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<sup>21</sup> Micah Altman et al., "Practical Approaches to Big Data Privacy over Time | International Data Privacy Law | Oxford Academic," OUP Academic, March 12, 2018, , accessed July 8, 2018, <https://academic.oup.com/idpl/article/8/1/29/4930711>.

<sup>22</sup> Paganini, Pierluigi. 2016. "The Ferizi Case: The First Man Charged With Cyber Terrorism". Infosec Resources.

data privacy and pertinent protection. However, some parts of the document and its suggested applications have been prone to criticism. The legislation's opponents cite the implementation of Data Protection officers and the section on data portability as evidence of the legislation's folly.

### United States

The U.S has established Privacy Shield Frameworks with the E.U and Switzerland. The frameworks, which have been accepted into all respective governments, are intended to allow for the proper dissemination of data between participating nations. Another reason that the United States is such an important player in discussions of data privacy is that some of the biggest data collectors in the world are American, including Google, Amazon, Netflix, and many more. Discussions of data privacy are sure to affect these corporations.

### India

This year, the nation passed a bill titled the "Personal Data Protection Bill, 2018" Its goal was to legislate a data policy that would be in line with European standards, but go the extra mile in adapting the policy in order to make it relevant to India's situation. In order to accomplish this, it was based on a mix of policies from the GDPR, and the nation's own "Information Technology Act".<sup>23</sup>

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## GOALS OF A COMMUNIQUE

1. With the rise to prominence of many technologies that store, gather and use massive amounts of personal data, how do we ensure that individuals are protected, without hindering the advancement of cutting-edge technologies?
2. To what extent should public education be an element of a plan to protect against abuses of personal data?
3. How can governments be held responsible for the misuse of data collected illegally from foreign nations?

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<sup>23</sup> Asheeta Regidi, "Data Protection Bill Series: Quick Overview of India's Draft Data Protection Law," *Tech 2*, September 30, 2018.

# GLOSSARY

**Automation:** A process in which technology is used to perform a task that was previously done by a human, especially a production task.

**Data Privacy:** a citizen or organization's right to control, and be free from surveillance, of the information they share online

**Data Protection:** is the safeguarding of information from outside actors who wish to view, destroy, or corrupt it.

**Fintech:** portmanteau of 'financial technology,' describes technological innovation in the financial sector (eg. robo-advisors, cryptocurrencies, & open banking).

**Innovation:** The evolution of something previously established, especially by introducing new ideas, methods, or products. Types of innovation range from sustaining innovation which does not significantly alter markets, to disruptive innovation which creates a new market by overtaking an old one.

**Legacy system:** An old or outdated information system (digital or otherwise) that is cemented in place by a prohibitive replacement cost or by inertia. Often, this hinders the information system users' ability to adapt to current market trends.

**Moore's Law:** The observation that the number of transistors in a dense integrated circuit doubles approximately every two years (roughly accurate from 1947-2015). Commonly cited to support the idea of exponential technological improvement.

**Open banking:** third-party applications that use bank data to build a connected financial platform (eg. Mint).

**Price advantage:** A company's ability to evaluate expenses & income to determine a consistently beneficial profit margin.

**Smart Cities:** Population centers in which infrastructure has been built with a focus on technological connectivity in the pursuit of efficiency and a high quality of life.

**Technological disruption:** Disruptive innovation that is facilitated by technological development.

**Urbanization:** The transition from rural to urban, typically driven by an increased density of population and business, and accompanied by large-scale infrastructural projects.

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