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The No Collar Economy

Exponential Change
and the Digital Revolution

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and the Digital Revolution

Authored by Samuel George & Felipe Buitrago

About the Authors

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His portfolio features the documentary film series *The Crossroads* investigating critical hot spots in economics, politics and digital transitions around the globe. He is the author of *The Pacific Pumas: An Emerging Model for Emerging Markets*, a keystone text that identifies the advancements and opportunities of Chile, Colombia, Mexico and Peru.

Felipe Buitrago

is director of TicTac, a Colombia-based think tank.

He leads research and policy-design initiatives to foster development based on harnessing the opportunities of digital technology in finance, investment, and national transformation. He is the co-author of *The Orange Economy: An Infinite Opportunity*, the most downloaded publication in the history of the Inter-American Development Bank.

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Cover photo by SpaceX on Unsplash.

Foreword

Our world is constantly changing—a simple truism that is not unique for any given generation or era. And yet the very fact that our dynamics shift continues to surprise us.

We routinely observe that we live in turbulent times without pausing to consider that times are always turbulent. When was the last time a major policy speech began "Times are pretty normal. Everything is as expected. Let's just put this planet on auto-pilot for a while"?

Instead we are prone to hyperbole, to view the constant shifts as existential threats to our way of life. We believe "this time is different." In fact, be it the inventions of the cotton mill or the internet, humans have shown a remarkable ability to adapt. Our way of life changes but life continues.

Photo by Samuel Zeller on Unsplash.

This is our aim with The No Collar Economy – to spark an inclusive conversation.

And yet this book begins with a simple premise: This time *is* different. The exponential change caused by digital innovations has changed the way we work, the way we play, the way we buy, and the way we bank – all in the span of a couple decades. And as a digitizing society, we are just getting warmed up. If it hasn't been disrupted yet, it will be soon. From the labor market to the dating market, digital tools are rapidly redefining the rules of the game.

Analyzing the impact of these changes cannot simply be the purview of inscrutable academic papers and think-tank debates in Washington and Brussels. If the digital transition occurs in an unbalanced fashion, many could end up on the outside looking in, their jobs made obsolete by machines and their skill sets inadequate to compete for a shrinking pool of high-quality, contract-based positions.

We believe this alienation, perhaps still in an incipient phase, in part sparked the populist backlash witnessed on both sides of the Atlantic over recent years. The visceral complaints may have been levied against globalization, elites and foreigners, but at the heart of all three is the lingering angst that the world is changing and people are being left behind.

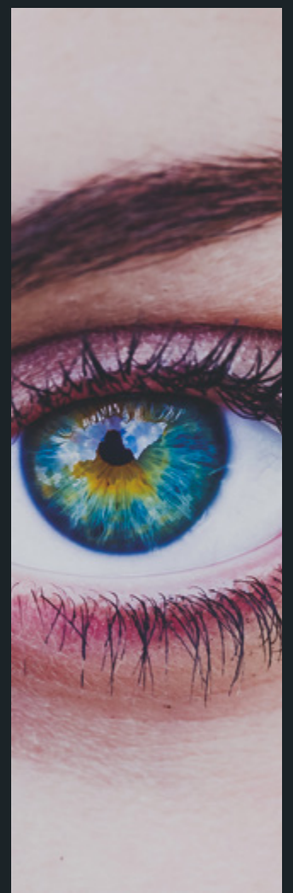
The conversation on the digital economy must be inclusive. It must consider the opportunities, the threats, the challenges and the inevitability of the digital transition. This is our aim with *The No Collar Economy* – to spark an inclusive conversation. Once we understand how the rules are changing, we can devise winning strategies, not just for New York or London, but for society as a whole.

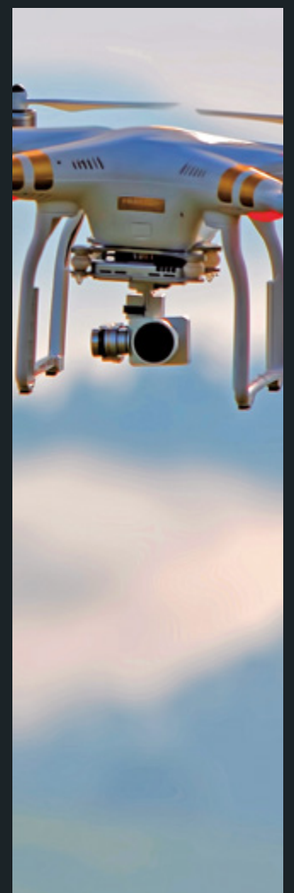
In this case, digital can work for us, and not the inverse. At least until the `next disruption.`

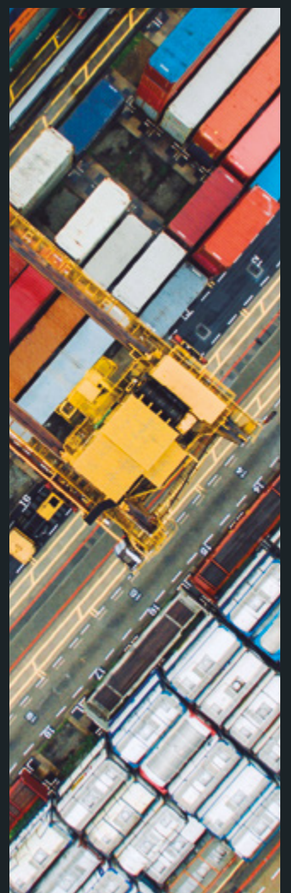
Irene Braam

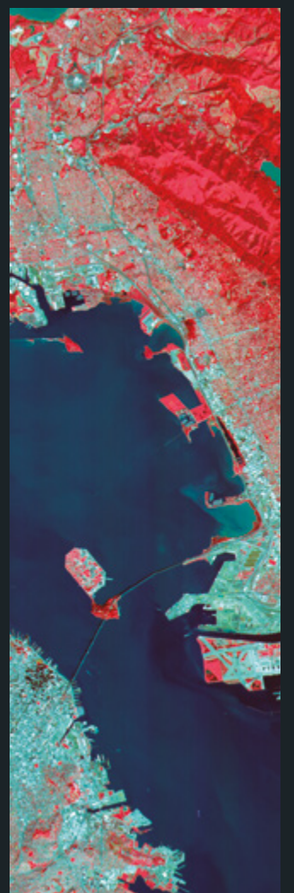
Executive Director
Bertelsmann Foundation
North America

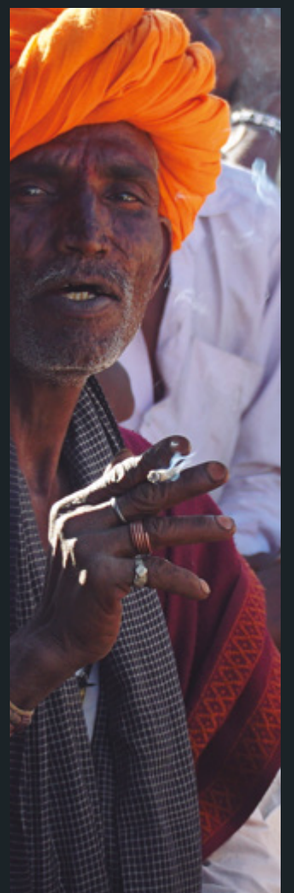
Chapters

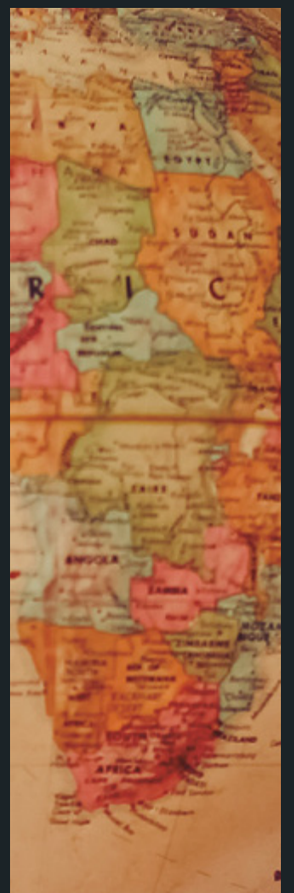


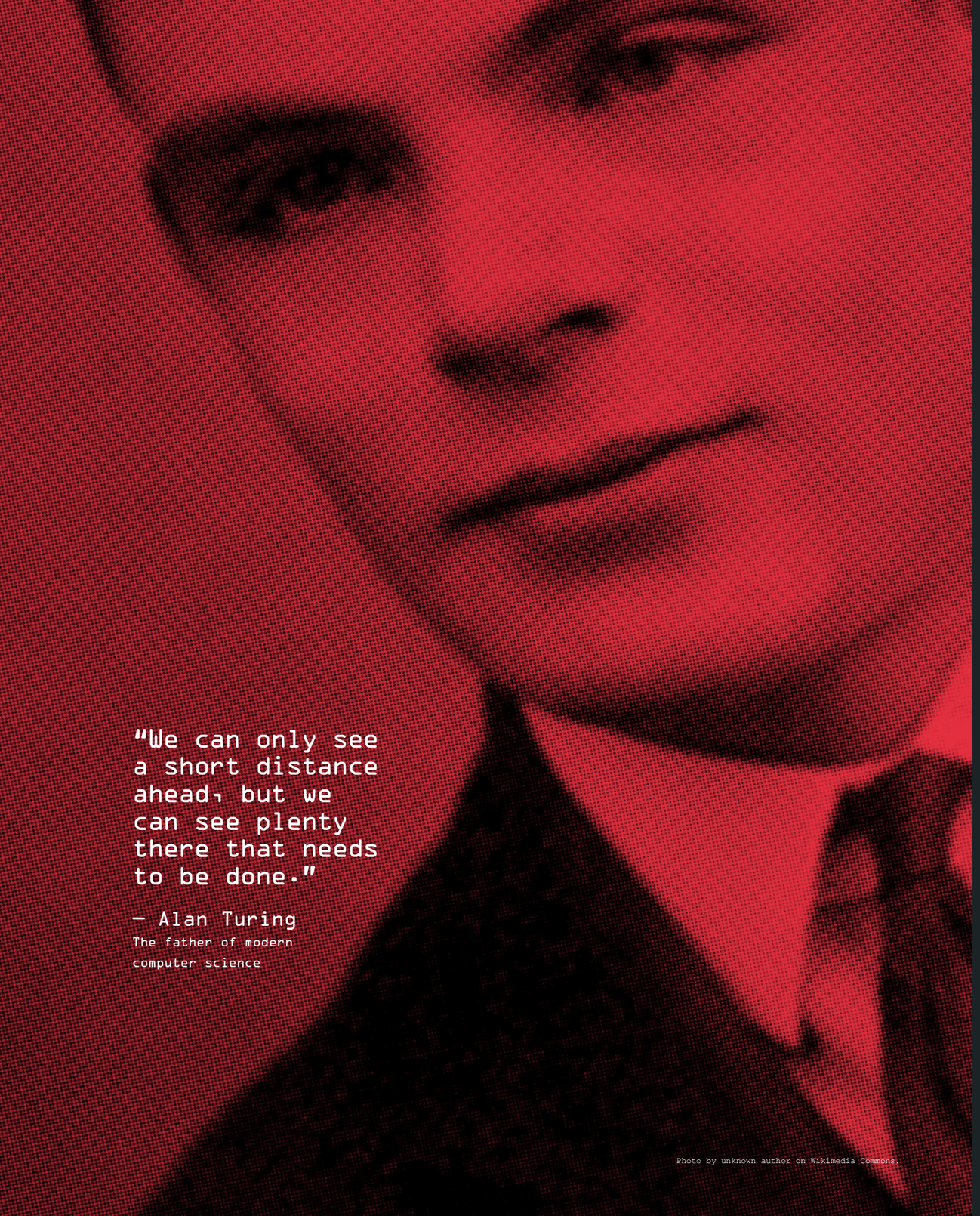












"We can only see a short distance ahead, but we can see plenty there that needs to be done."

– Alan Turing

The father of modern computer science

Photo by unknown author on Wikimedia Commons.

The
No Collar
Economy

Chapter

1

Exponential Change

So, let's talk about
how wrong we are.

Many of us **believe we understand exponentiality.** Most of us **don't.**

Even people who are familiar with the math behind the concept tend to misinterpret it regularly.

We do this because in the short term, the exponential feels linear, and linear is how our key survival skill of pattern recognition works.

So you think you know
exponentiality?

"Wrong!"

Photo by Gage Skidmore on Wikimedia Commons.

"Believe me,

exponentiality is huge.

It's so huge,

it's unbelievable."

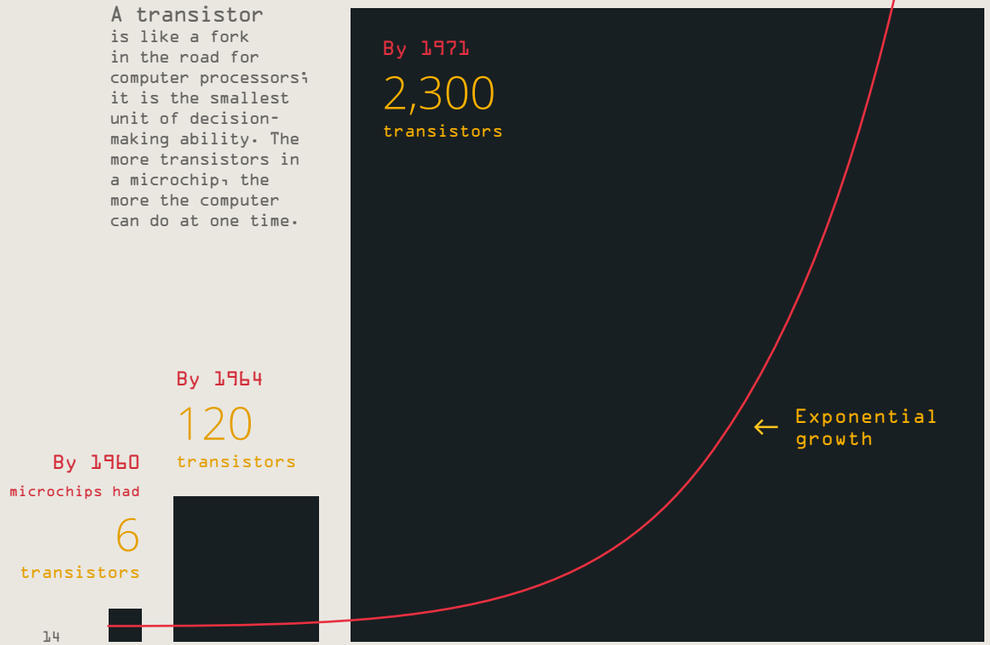
Photo by TextureX.com

Digital Exponentiality

Let's see.

On May 23, 1960, a team led by Robert Noyce, co-founder of Fairchild Semiconductor and Intel, produced the first integrated circuit, or microchip, based on silicon. It contained six transistors.

A transistor is like a fork in the road for computer processors; it is the smallest unit of decision-making ability. The more transistors in a microchip, the more the computer can do at one time.



By 1974
10,000
transistors

This prediction is known as Moore's Law, and it has held true to today.

In 1975, Gordon Moore, who co-founded Intel with Noyce, predicted that the number of transistors packed in a microchip would

double

every two years.

So, how many transistors do you think are crammed into a microchip in your smartphone?

Take a wild guess,

and write it down, so you don't cheat ;-)

Millions, right?

That's more transistors in one microchip than people on Earth, and more transistors in your smartphone than the total number of humans who have ever lived.

10 to 30 billion!

If you think the number of transistors in a single microchip expanded rapidly, consider that the *power* of the microchip grows even faster as the possible number of transistor combinations increases. This is exponential growth on top of exponential growth.

And it is the

DNA

of the
No Collar Economy.

Number of transistors
and possible combinations

6 transistors
=
720 combinations

---

100 transistors
=
4,950 combinations

---

1 million transistors
=
500 billion combinations

---

10 billion transistors
=
500 quadrillion combinations

That last one is a 5 followed by 17 zeros.
500,000,000,000,000,000

In other words, as the number of transistors grew in 57 years by a factor of

1.67 billion,

a microchip's computing power increased roughly

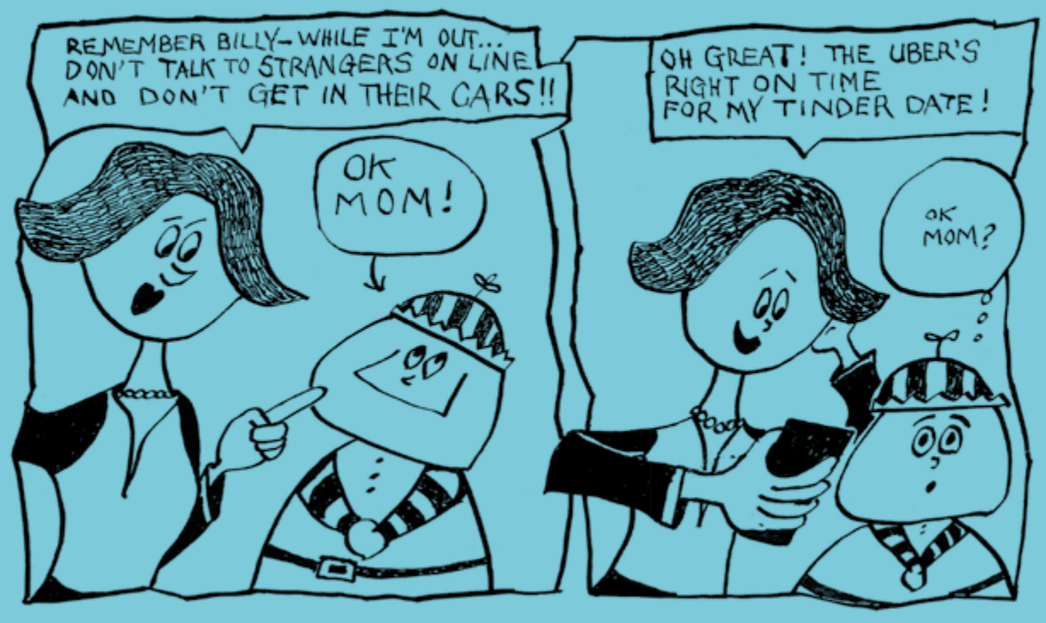
415 thousand times

more in the same period.

It's more complicated than simply combinations. Microchips are optimized for different purposes: video, sound, memory, and time-keeping, to name a few. This means no single one is fully able to access 100 percent of its possible combinations. Just as in urban street design where one-way roads optimize mobility, microchips follow several efficiency paths.

Now, what does that mean to us? Well, think again about your smartphone:

For one thing, its current computing power far exceeds NASA's needs in 1969 to launch a crew of three into space, land Neil Armstrong and Buzz Aldrin on the Moon, and return them to Earth safely in the Apollo 11 mission.[1]



That is why you can simultaneously handle a dozen conversations on WhatsApp, check your three e-mail accounts, request an Uber while securing a reservation at the restaurant you are eyeballing on Yelp!, share your political insights on Twitter, and post photos of that fancy dinner on Instagram.

Because the world is oh-so desperate to hear them 😒

Bell's parents then got a line, and he began working on the answering machine.

 And that's just with something that fits in the palm of your hand. On a wider scale, our combined processing power is also growing. There is historical precedent for this: The telephone was almost useless in 1876, when Alexander Graham Bell patented it.
 The phone was a great idea, but Bell was at first able to call only his assistant. When a couple friends connected to the system, the device became more useful. Soon enough we reached a point where a quarter of the US population was interconnected.
 By 1910 this was a communications revolution.

Economists describe this as a

"network effect"

and it's what's happening with transistors in a microchip. A new transistor connected to the network creates more options for transistors previously connected.

Photo by Jingyi Wang on Unsplash.

Finally, there is another layer of complexity:

speed and latency.

Latency.
The time delay between an action and its effective transmission through the system.

1 Exponential Change

 On December 15, 1991, President George H.W. Bush launched operation Desert Storm to liberate Kuwait from Iraqi occupation. The operation's precision and coordination surprised Saddam Hussein's forces, and captivated the world with what was described as the first war to be transmitted live on TV.
 This was possible only because the US military managed to dedicate the equivalent of 100 megabytes per second[2] to the coordination and exchange of information among satellites, AWACS (a special kind of radar mounted on top of a plane), commanders on the ground, and intelligence experts halfway around the world. It was unprecedented.

Introducing 5G.

 A fifth generation of mobile data communications is around the corner. The first full-fledged 5G network is set to be activated for the Winter Olympics in February 2018 in Tokyo. What makes this development special is the speed of data transfer 5G devices will provide: between 100 megabytes and 1 gigabyte per second, or between 1 and 10 times the data-transferring capabilities that the entire US military committed to Desert Storm.

And the 5G device will fit in your pocket!

There are already more than

2 billion devices[3]

connected to 4G networks. And at the Mobile World Congress in March 2017, the ICT industry advocated for an accelerated adoption of the 5G network, with a target of connecting 1.1 billion devices by the end of 2019.

From desktops to laptops to tablets to TV sets to surveillance cameras to parking meters to windows to doors to lamps to vehicles to just about everything you can imagine. Altogether, by 2020, there could be

50 billion devices

connected to the internet.[4]

Massive disruption is not coming soon…

It is already happening.

So what are we gonna do about it?

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Lose the Tie, **Find the Hotspot**

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 Paul's apartment is a mess. Pizza boxes, soda cans and an assortment of video games are spread out across the floor like a Sevillan fan. In the evenings he pairs beer with beer, and in the mornings he rolls out of bed and is off to work in a pair of Levi's and a t-shirt. In short, Paul is not altogether different from the generations of Americans that have preceded him. He is a young man fumbling through his 20s, one box of easy mac and cheese at a time.

 He is not off to wait tables, however, and he is not studying for the GRE. Paul—t-shirt, jeans and all—is off to Mountain View, California, ferried by private carrier to the headquarters of Alphabet, Inc. Born at the right time and with the right skill set, Paul is scouting the uncharted areas of a vast new frontier. You see, Paul knows how to work a computer. Or, better yet, Paul knows how the computer works.

 But there's more to it than that because the really important things—the seismic shifts in our economy—are not occurring on the computer, but rather between computers. Paul understands our digital transformation, the imprecise transition of nearly all that we once knew as physical to a new, online universe. The encyclopedia, the sports page, the store, even cash: In the span of about two decades the things that we once held in our hands or visited on foot will have moved to the new frontier. Our newfound cloud-based environs will upend global economics, just as the discovery of "new worlds" did in the 15th-century.

 In our rapidly transforming 21st-century economy, Paul is an ace, a ringer, a guy who can help create an empire with a laptop and some La Croix. He is a computer engineer, contributing code to Google's search engine, the company's golden goose. The veritable foundation of a US$600

How important is Google?

Let me google that for you:

Google's search index contains over 100 million gigabytes of data;

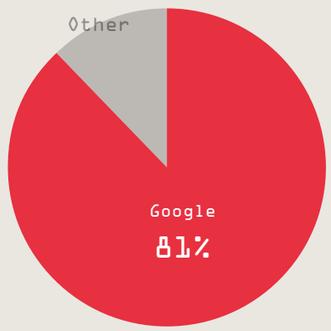
1.2 trillion searches per year worldwide;

Around 20 percent of daily queries have never been asked before;

A single Google query uses 1,000 computers in 0.2 seconds.

When Google went offline for five minutes in 2013, global internet traffic dropped by 40 percent.

The competition is still searching for an answer.



Global Desktop Search Engine Market Share, July 2017.[5]

billion behemoth. He buttresses a code that instantaneously sifts through the internet's unfathomable amount of information to find the answer to your obscure question, often before you even finish typing it.

 The value to Google of being the best at this is somewhere between US$600 billion and incalculable. As long as Google remains the industry standard-bearer, it will continue to build upon the current average of 40,000 search queries per second, 3.5 billion searches per day, and 1.2 trillion searches per year.[6]

 But it's more than just eyeballs. We tell Google exactly what we are looking for, and in real time.

 The combination of traffic and information is unbeatable for business, which poured upwards of US$80 billion in advertisements into Google coffers in 2016.[7] Google Search is the backbone of a digital empire that seeks expansion into everything from your pocket, via Android phone, to your earbuds, via Google Play. The Spanish Empire suffered a mortal wound when Napoleon Bonaparte took Madrid early in the 19th-century. Should Search falter, Google's sprawling ecosystem could slump.

 The competition for eyeballs and information is cutthroat, and Paul's entire work environment—the cheese plates, the flexible hours, the frisbee fields—are geared to entice him to stay and ward off the daily pings from headhunters, poachers and starry-eyed start-ups. And Paul doesn't wear a white collar. He doesn't wear a blue collar. And he certainly doesn't own anything in pinstripes.

 The most coveted employees of our new economy wear no collar at all.

 And they work for companies that are often not selling anything, at least not in the traditional sense. Search, Gmail, Google Maps, YouTube—the Google ecosystem's key components are usually free to use. Even the things that are for sale—the Google Chrome laptop, for example—are intentionally underpriced because the real value for the company is getting as many people as possible on their platforms. In these early stages of the new digital world, enticing people into the system can be more important than making sales.

 Google is not unique. Many leaders of the digital economy do not own or sell anything at all. Uber does not rely on its own cars (to this point at least), Airbnb doesn't rent its own property, and Facebook's value is entirely user-generated. The biggest winners aren't focused simply on gaining capital, but rather gathering data and sharing it more efficiently.

<h1>

This is the **No Collar Economy**

</h1>

 The digital revolution has transformed the global economy faster than any other development in recent history. Given the exponential nature of this innovation, we may be only at the threshold of an era of profound change. Brick and mortar stores – cornerstones of real economics for centuries, if not millennia – are becoming obsolete, while software companies that sell nothing, but connect people to people and things, command billion-dollar valuations on Wall Street.

 The long-term effects of these trends are difficult to quantify. On one hand, the digital economy respects no borders, be they social, geographical or political. Families in rural Africa, for example, enjoy unprecedented levels of financial integration via mobile banking. In India, a government-run digital biometric scheme has registered more than one billion citizens, connecting many families to their

 Meanwhile, some digital giants *are* selling stuff – a whole lot of it. In 2016, online commerce accounted for eight percent of retail sales,[8] a figure that jumps to 11.7 percent if car and fuel sales are excluded.[9] Amazon, for example, has expanded from primarily an online bookstore to a one-stop shop for more than 300 million products,[10] from Fender guitars to baby formula.

 Such services revolutionize the way we shop – not just because they obviate the need to leave home. In addition, an increasing number of products sold are themselves digital in nature. Services such as Amazon Prime, Kindle Unlimited and Music Unlimited underscore a trend towards subscription-based consumption. Amazon's soaring profits stem from these digital products. The company's operating income from web-based services, which more than doubled from 2015 to 2016, actually outpaced profits from its retail services.

 Increasingly, people are not shopping for objects but for access. Digital downloads and subscription-based music services surpassed CDs in terms of revenue generation in 2015.[11] And there is no dress code in a digital store. Our grandparents may have dressed up to go food shopping, but millennials are subscribing to organic grocery delivery services from their beds, snug in their pajamas.

Bill Gates posits that by 2030,

"two billion people

who don't have a bank account today will be storing money and making payments with their phones."[12]

This figure is shocking considering that web-based services account for about 15 percent of the revenue generated from retail services.[13]

government for the first time. Leaders of India's digital push are convinced that a cashless economy will promote inclusive growth, curtail corruption, and help the country skip various steps on its path to development.
 Instead of manufacturing, 21st-century value-creation is increasingly "mind-facturing". Products are based on imagination, innovation and ingenuity. Rather than the hammer and wrench, the fundamental tools of the 21st-century are "apps", and people create the apps. This is post-industrial employment, and it is an exponentially increasing segment of the global economy.
 With access to the right software, anyone can become a film editor, a financial guru, or a journalist – and they can be instantly connected to potential clients worldwide. Advances in the "sharing economy" allow us to maximize our capital stock, from spare bikes to vacation homes, and they reduce entry barriers for would-be workers.
 At the same time, "disruptions" create winners and losers. Developed-world manufacturing jobs have already become increasingly rare. What happens to the taxi driver, the hotel manager, the TV salesman when Uber, Airbnb and Amazon take over? What happens to the Uber driver when the driverless car hits the streets? The value of a New York taxi medallion is already down 80 percent since 2014, and the White House estimates that over three million driving-based workers will lose their jobs to automation in the coming years.[16]
 What happens when a generation that should be at its professional prime can't keep up with digital developments?
 While nearly all Americans under the age of 45 have used digitally shared and on-demand services, 44 percent of Americans over 50 have not.[17]
 What of the millions of poor families worldwide who have no access to digital apps? Wealthy Americans already use digital sharing and on-demand services at three times the clip of poorer Americans.[18] In India, urban centers are rapidly adopting new digital tools, but many rural pockets lack the internet coverage to access services.
 In democracies, what happens when voters realize that machines, not foreigners, are taking their jobs?
 The digital revolution is exciting and intimidating, and the conversation about its economic consequences must not be limited to academics debating inscrutable research papers. With The No Collar Economy, we aim to highlight the importance of the revolutionary and exponential change heralded by the digital economy's expansion.

 Let's get down to business.
</html>

The point is not that these jobs are easy, but that

talented people from remote areas

can now do them.

Airbnb is now active in 191 countries. That's

65,000 cities with over 2.3 million properties available for rent.

Estimates hold that hotels lose approximately

US$450 million

in direct revenues per year to Airbnb.[14]

From US$1.3 million in 2014 to US$250,000 in late 2016 according to *Business Insider*.[15]

The
No Collar
Economy

Chapter

Bank to the Future

Why FinTech Changes How (and Whom) We Finance

Just as many of today's bankers believe their jobs are unassailable, some 800 years ago the Jin Dynasty was confident that no ragtag band of nomads would breach the impenetrable string of fortresses now known as the Great Wall of China. But leading those outsiders was one Genghis Khan, and in less than a decade after he came to power the Mongols would establish their own dynasty in the Middle Kingdom. They proceeded to rule China for over two centuries.

Fast forward to the present day, and we have **financial technology (FinTech) start-ups lurking around the edges of Wall Street**—prodding for a soft spot and plotting an incursion.

Will FinTech break through the Street's formidable barriers, and rearrange the financial sector as we know it? Will the Morgan Stanleys and the Western Unions of today become fallen dynasties? Or will the traditional players harness advancements, using technology to forge a renaissance for their beleaguered sector?

Only time will tell.

But one thing is certain.

If the current financial industry is to remain relevant, it must brace for a **FinTech-tonic shift of unprecedented proportions.**

Photo by Irving Underhill on Wikimedia Commons.

FinTech carries awesome potential for creative disruption, and the financial industry—the very creators of money—must manage this global dash towards both disintermediation and demonetization. Increasingly, people worldwide are using new technologies and tools to cut out expensive and inefficient intermediaries in the financial sector, while mobile wallets and digital transactions force society to confront the value of physical cash.

Historically a highly regulated industry dominated by traditional entities, the banking and financial sector faces increasing competition.

Since 2011 alone, venture capitalists have poured nearly

US$23 billion

into FinTech start-ups[1], and the rate of investment could increase **exponentially** in the coming years.

For example, the

US$12.2 billion

invested in 2014 dwarfed the 2013 figure of roughly

US$4 billion.[2]

The potential spoils have attracted an expanding group of players.

These players range from the usual suspects placing bets on digital platforms

—see Morgan Stanley's

US$100 million

buy-in to Affirm Inc., a start-up that provides alternative online financing[3]—

to newcomers

such as India's wildly popular Paytm mobile wallet, which attracted

200 million

users following New Delhi's unexpected retirement of 500- and 1000-rupee notes in late 2016.[4]

Many start-ups and concepts will fail. But some will succeed, and these apps, mobile wallets and platforms will radically transform the way

we save, invest, spend, sell, lend and borrow,

from the previously forgotten pockets of the developing world to the globe's most advanced metropolises.

You can bet your bottom dollar on that - except, if current trends persist, many of us soon won't be carrying dollars.

We know that one in three millennials does not expect to need a bank within five years,[5] and India, the world's second-most populous country, is rapidly pursuing a cashless economy.

The No Collar Economy Could Go Cashless.

Photo by Igor Ovsyannykov on Unsplash. Icons by The Noun Project.

How will FinTech change our lives?

Let's consider the purchase of a first home, a milestone moment for many young families. It's an intimidating process, with long-term financial implications, and one fraught with seemingly endless obstacles: **inspections, certificates, co-signers, lawyers' fees. A transaction can take months and leave all sides feeling short-changed.**

This is precisely the kind of red tape that digital innovation has proved adept at shredding.

Imagine that as a prospective buyer tours her dream brownstone in Washington, DC she uses her phone to verify in real time the property's ownership and history, the neighborhood's safety and transportation accessibility.

Imagine then an app that verifies her identity and financial history by simply touching, looking, and talking to the phone.

Then in a matter of seconds it offers a series of financing options.

Some of these options come from **traditional banks.**

The majority might well come from **peer-to-peer lenders (P2P)** via new digital platforms that "connect borrowers to investors faster than any bank."[4]

Outfits such as SoFi and Reality Mogul focus on P2P mortgages, cutting out the traditional intermediary (the bank) and thereby reducing costs and time.

Meanwhile, the property's owner can review her offer while the perspective buyer dreams about the wallpaper in her soon-to-be-acquired living room.

She picks one of the offers.

He accepts her offer by touching, looking, and talking to his phone...

from Los Angeles.

Photo by Luca Iaconelli on Unsplash.

Icons by The Noun Project.

All the procedures and payments, the commissions and taxes are executed in a matter of minutes without printing a single sheet of paper.

Which is why, five years from now…

2018 2019 2020 2021 2022

77%

of the incumbents in the financial system expect to adopt blockchain as part of an in-production system or process.

82%

expect to partner with FinTech start-ups.[7]

Ana Botin, president of Banco Santander, one of the largest European financial organizations, has announced yearly investments of

€1.9

billion

in FinTech development.[8]

Such technology will challenge the way people interact with the financial system, offering the potential of a safer, convenient, agile and simplified banking experience. These innovations can eliminate the information asymmetries endemic to the financial-services industry while addressing age-old barriers to accessibility. The emergence of disruptive forms of financing, savings, spending, and investment is already happening.

Institutions that fail to reinvent themselves will suffer

the fate of the dinosaurs.

Blockchain. An inherently secure way to safeguard data from modifications, as every new set of records (a block) is encrypted, timestamped and linked with the latest set in the string of records (the chain).

As the Information Technology & Innovation Foundation states,

"the financial-services industry has a long history of using IT for innovation".

Quotation and data courtesy of Alan McQuinn, Weining Guo, and Daniel Castro. *Policy Principles for Fintech.* Information Technology & Innovation Foundation, October 2016.

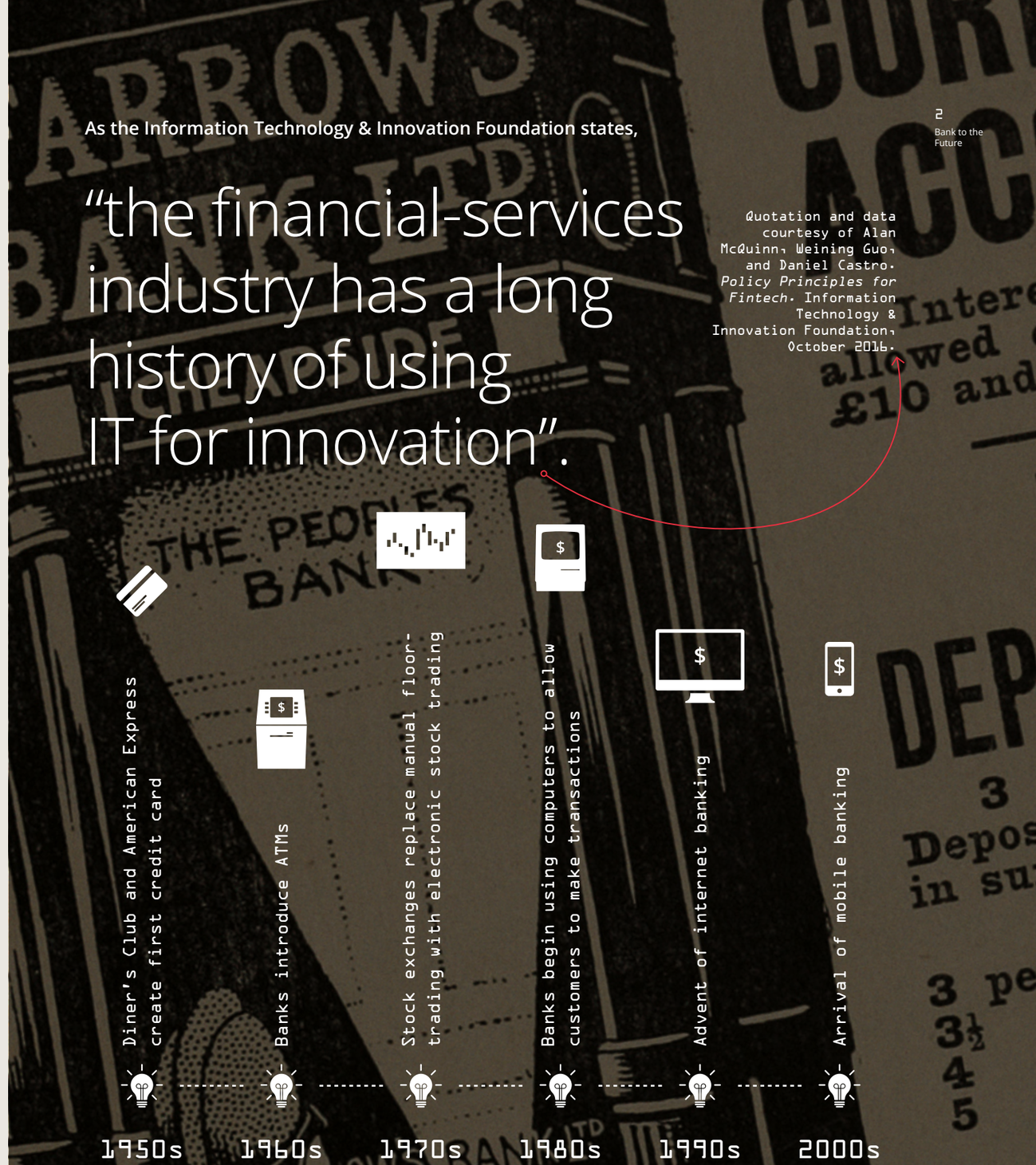


Image by Internet Archive Book Images on Wikimedia Commons.

Icons by The Noun Project.

Keep
the Change

FinTech's pervasiveness could upend regulatory and geographical barriers erected over 500 years of financial evolution.

Source: ITIF

Today's banking is being fundamentally transformed

by digital technologies as…

we transit the road to a cash-free world with unlimited access to capital in the cloud, disintermediated and at a minimized risk in a wholly automated system.

- **Cash** (emissions)
- **Capital** (accumulation)
- **Loans** (intermediation)
- **Transactions** (logistics)

In April 2015,

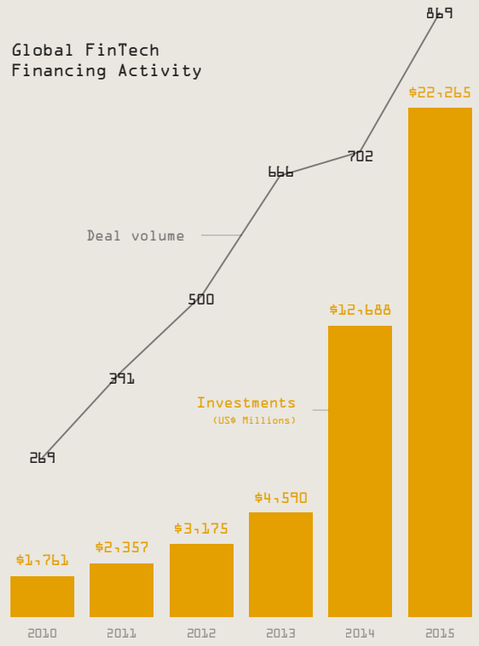
about 800 companies

pursued FinTech initiatives.

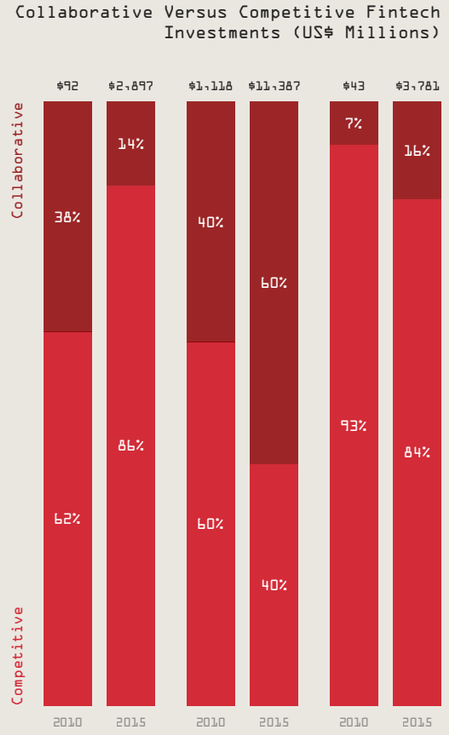
That number spiked to between

2,000 and 16,000 ventures

by the end of the first half of 2016.[9]



Source: Accenture, 2016.



Source: Accenture, 2016.

Alternative Financing

Digital tools have rearranged personal financing:

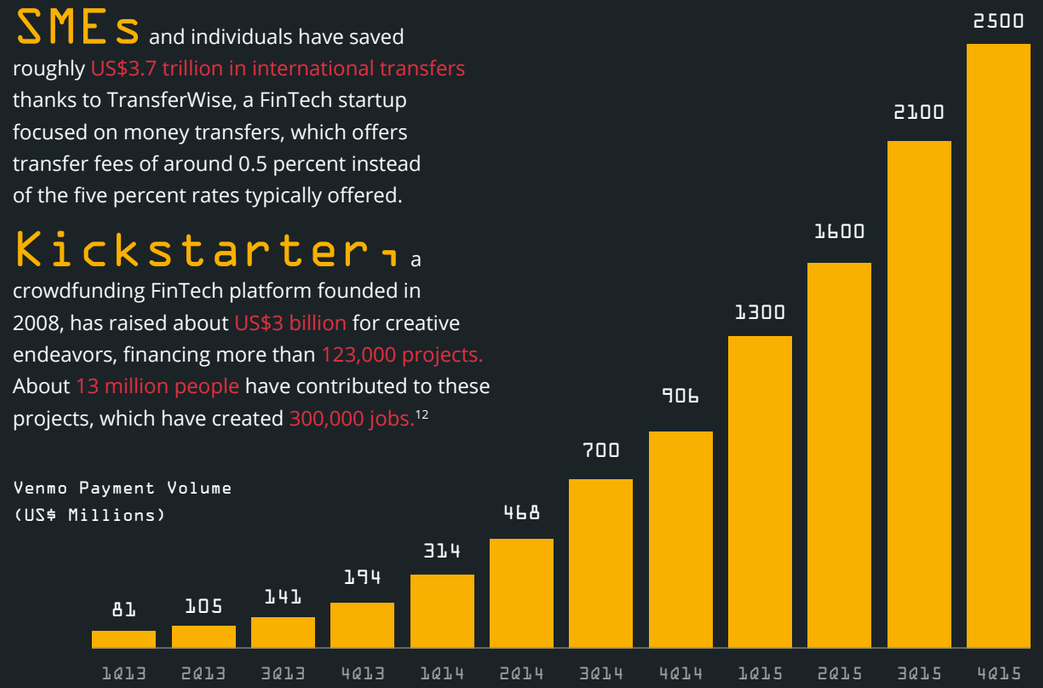
ZOPA, a FinTech P2P lending platform, has helped more than 233,000 people buy new cars, improve their homes and take control of their finances. Since 2005, it has provided loans totaling US$2.8 billion to British consumers.[10]

Venmo grew 103% over the year to Q2 2017, reaching $8 billion in quarterly P2P payments processed.[11]

SMEs and individuals have saved roughly US$3.7 trillion in international transfers thanks to TransferWise, a FinTech startup focused on money transfers, which offers transfer fees of around 0.5 percent instead of the five percent rates typically offered.

Kickstarter, a crowdfunding FinTech platform founded in 2008, has raised about US$3 billion for creative endeavors, financing more than 123,000 projects. About 13 million people have contributed to these projects, which have created 300,000 jobs.[12]

Daviplata is a Colombian bank-owned platform that allows one to send and receive money from a mobile device, receive international money orders, receive cash payments at Davivienda offices, pay public services, recharge cellular phone credit and/or withdraw up to the equivalent of US$800 at Davivienda network ATMs for a US$1-2 fee.



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Mobile **Banking**

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Mobile Banking. The ability to conduct financial and banking transactions via SMS and smartphone applications. In more developed countries, the technology eases access to accounts, as the programs are accessible 24 hours a day. In rural parts of developing countries, mobile access can mean the difference between having and not having access to formal financial systems.

 FinTech has already made major inroads into the banking sector, a trend that appears to correlate with the expanded use of smartphones. The US Federal Reserve finds more than half of American smartphone owners used mobile banking in 2016, most typically to perform quotidian tasks such as "checking balances or recent transactions, transferring money between an individual's own accounts, and to receive alerts."[13] The same survey notes that mobile-banking usage spikes to nearly 70 percent when considering millennials only, suggesting a forthcoming demographic boom in terms of mobile banking (the study found only 18 percent of people over the age of 60 bank online).[14]

 Thus far, in Europe and the US, the trend towards mobile banking has been more about convenience than disruption. The technology has certainly had repercussions—more than 1,600 US bank branches closed in 2015[15]. But perhaps the biggest impact has been allowing tech-savvy individuals to access their traditional banks without having to skip out early from work to catch a teller before 5:00pm. The client-bank relationship remains, but has moved online.

 As JPMorgan Chase CEO Jamie Dimon noted in 2015, "Silicon Valley is coming" and start-ups are already competing aggressively in mobile payment and loan alternatives. A start-up's challenge is convincing consumers of the value of such services. Only 28 percent of American smartphone owners report having used mobile payments in the last year, with many survey respondents claiming "their needs were already being met without mobile payments... and that they did not see a clear benefit from using such a service."[16] Even Americans who do complete mobile transactions are often comfortable using traditional banks and credit cards. Major US financial institutions

Insights suggest that regulations, along with technology, are responsible for some of the closures.

The Digital Banking Report estimates that visits to brick-and-mortar bank branches can be reduced by a third if more people deposit checks via mobile applications.

feel the heat, but the relatively advanced banking system has an opportunity to survive if it can incorporate digital innovation.
 Traditional banks have significant advantages in more advanced economies. While they may grouse about regulations, the thick legal code also creates barriers to entry, especially for smaller start-ups. Generally speaking, FinTech companies cannot offer traditional services such as debit or checking accounts. One might use Venmo, a digital wallet, to complete an electronic payment, but the Venmo account must be connected to an account at a traditional bank to execute the transaction.
 The story in the developing world is different. As a CitiBank study succinctly concludes,

According to a 2016 Citi investigation, "to remain competitive, banks need to get innovation before the FinTech companies get scale."

"Emerging markets often have a high percentage of unbanked population, relatively weak consumer banks, and a high penetration of mobile phones. Hence, they are ripe for FinTech disruption."[17] In other words, a farmer in rural Rajasthan may not even have a bank account. For him, a mobile wallet program such as Paytm, which permits storing and transferring of funds via mobile transaction without a bank account, does offer a clear benefit. And market players are well aware of that. From Peru to Kenya to China, emerging markets are at the cutting edge of FinTech and the programs and platforms are incorporating millions of families into formal financial ecosystems for the first time.

<h1>

FinTech and Financial Inclusion

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 Lack of access to the formal economy represents a critical bottleneck in global development. Such exclusion can manifest itself in different forms. Off-the-books labor, with limited advancement opportunities, acts as a drag on growth. A lack of access to financial markets and toolkits also takes a toll.

The ILO estimates that "more than half of the global labor force and more than **90 percent** of micro and small enterprises" are in the shadow economy.[18]

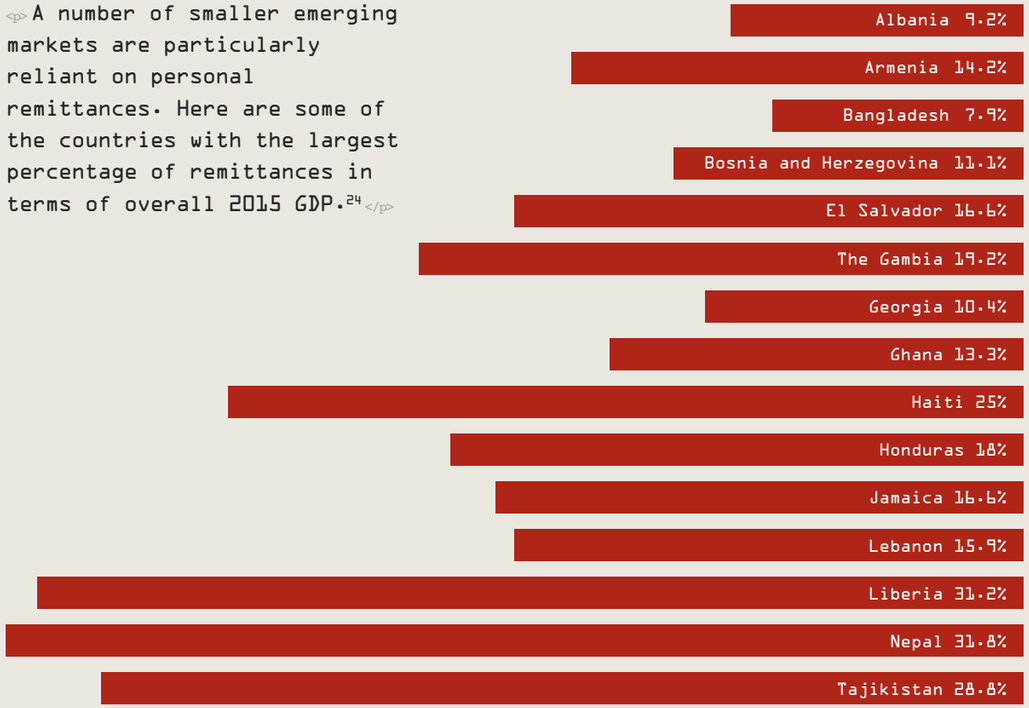
 The World Bank estimates that two billion adults cannot avail themselves of formal financial services.[19] These people, who are concentrated in poorer, rural areas, are unable to save, invest, insure, borrow, or send and receive money beyond the most basic cash transactions. They are subsequently cut off from broader growth patterns and particularly vulnerable to unexpected shocks. Global institutions such as the World Bank and United Nations have made clear that inclusive growth requires inclusive financing.
 A primary cause of financial exclusion in the developing world is distance: Traditional banks have not established brick-and-mortar branches in poorer, remote regions. The slim profit margins or limited liquidity opportunities in these areas have curtailed the interest of traditional institutions. This supply-side bottleneck is matched on the demand side. Given the "leakages" in many emerging-market financial systems, many people—especially those lacking financial literacy—distrust systems that have byzantine or inaccessible paper trails. In short, traditional financial institutions do not expressly serve excluded communities, which also do not trust (or remain unaware of) such institutions.
 Digital tools address these supply and demand constraints. On the supply side, the farmer in rural Rajasthan may not be able to reach a bank branch, but there is a reasonably good chance that he has access to a mobile device: India boasts more than one billion mobile subscribers[20] and 220 million smartphone users.[21] Via phone, individuals create accounts—with traditional banks and start-ups—that allow them to manage, save, receive and transfer money. Sticking with the example of India, Paytm, the Indian company offering mobile-wallet services, facilitates roughly seven million transactions daily. These range from recharging phone tariffs to paying utility bills to shopping on the app's marketplace, where users can browse clothing, electronics, home goods and more.
 FinTech has already had a major impact on the sending and receiving of remittances, whose total global value spiked from US$68 billion in 1990 to US$586 billion in 2015. Just in the US the value of remittances leaving the country dwarfs the foreign aid budget. Thus, efficiency improvements in this critical economic sector are of particular value to emerging markets. Remittances to El Salvador, for example, account for more than 16 percent of the country's annual GDP.[23]

Remittances are transfers of money via mail or online often across borders.

As India's digital economy expands, Paytm has become ever more important. The firm:

- Eclipsed 200 million registered users in 2017.
- Processed over one billion transactions in 2016.
- Expanded to over 850,000 brick-and-mortar merchants that now accept Paytm payments, for example in grocery stores and pharmacies.
- Forged partnerships with Uber and other apps to act as payment mechanism.[22]

A number of smaller emerging markets are particularly reliant on personal remittances. Here are some of the countries with the largest percentage of remittances in terms of overall 2015 GDP.[24]



As anyone who has sent money via Western Union can attest, traditional mechanisms of international transfers can be costly, with different banks charging their own service fees as money is routed to its final destination. An initial transfer of US$200 means, after fees, roughly US$184 at the end of the transaction.[25] And there is little transparency about the eight-percent loss.
But this could be changing. As FinTech investors Paul Breloff and Jeff Bond write,

"The opportunity to 'disrupt remittances' has become FinTech's honey pot, luring entrepreneurs of all kinds to join the party and see if they can offer better pricing, better service, better experience, better everything."[26]
With this in mind, start-ups such as Xoom, Azimo and WorldRemit have developed their own software that allows them to execute transfers digitally at real-time exchange rates, while bypassing the traditional banking system.[27] TransferWise uses a P2P system to match people looking to transfer the same currency but in the opposite direction. Someone with rupees wanting to send dollars is thereby matched with a dollar holder wanting to send rupees. The software eliminates the need to convert via a traditional bank, making the service significantly cheaper than that conducted by traditional methods.[28]
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Case Study: No-Collar Financing **in Kenya**

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Financial exclusion is particularly prevalent in sub-Saharan Africa. In Kenya only 40 percent of citizens had a traditional bank account in 2011. Banks typically open branches only in towns, eschewing rural villages. Rural residents often face "substantial minimum balance requirements and withdraw fees" and fees to open an account.[29]
Enter digital tools: M-Pesa, a mobile-phone-based money-transfer program launched in Kenya in 2007, has scored a major success for spreading financial inclusion. Originally conceived as a mechanism for streamlining microfinance loans, M-Pesa rapidly morphed into a money-transfer service.
Individuals put funds into M-Pesa accounts via ubiquitous "airtime" agents: often streetside vendors who also sell cell-phone credits. Money can then be transferred to others using a mobile-phone-based menu. The exchanges can be conducted for highly competitive (if not necessarily cheap) rates because the mobile program requires little overhead or physical presence. All that's needed to use the platform is mobile access.

The fixed-cost fee schedule can make low-cost transfers proportionally more expensive.[30]

The phone became a bank, and suddenly financial access was available anywhere in Kenya that had mobile access.

 Via M-Pesa, Kenyans have saved hours previously lost on transportation to locations where rudimentary transactions can be made. Moreover, the simple digital interface inspires confidence in mobile transactions, while years of violence and ethnic tension had bred distrust of traditional banks.[31]
 M-Pesa's impact has been stunning. *The Economist* reports that 17 million Kenyans use it, and roughly a quarter of the country's annual GDP passes through it.[32] Critically, the program has made inroads with the previously un-banked. By 2014, seven years after M-Pesa's advent, 67 percent of Kenyans partook of banking services.[33] By that same year, 72 percent of Kenyans living outside the capital on less than US$1.25 per day were using M-Pesa.[34]
 A number of start-ups have mimicked M-Pesa technology, offering Kenya's mobile bankers different services and prices. The M-Shawari program, a joint operation between M-Pesa's owners and the Commercial Bank of Africa, offers loans and savings programs to clients.[35] Meanwhile, M-Pesa has expanded beyond its initial roots to other African countries, central and southern Asia, and the Balkans.
 M-Pesa is not a silver bullet, and some question whether the positive press and hype outweigh the actual benefits.[36] The company will either continue to innovate and improve or face stiff competition from others (Paytm, for example, vies with M-Pesa in India). Either way, digital wallets have already extended financial access beyond white- and blue-collar clients to the unbanked, allowing them to join the No Collar Economy.

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Cryptocurrencies Towards a New Gold Standard?

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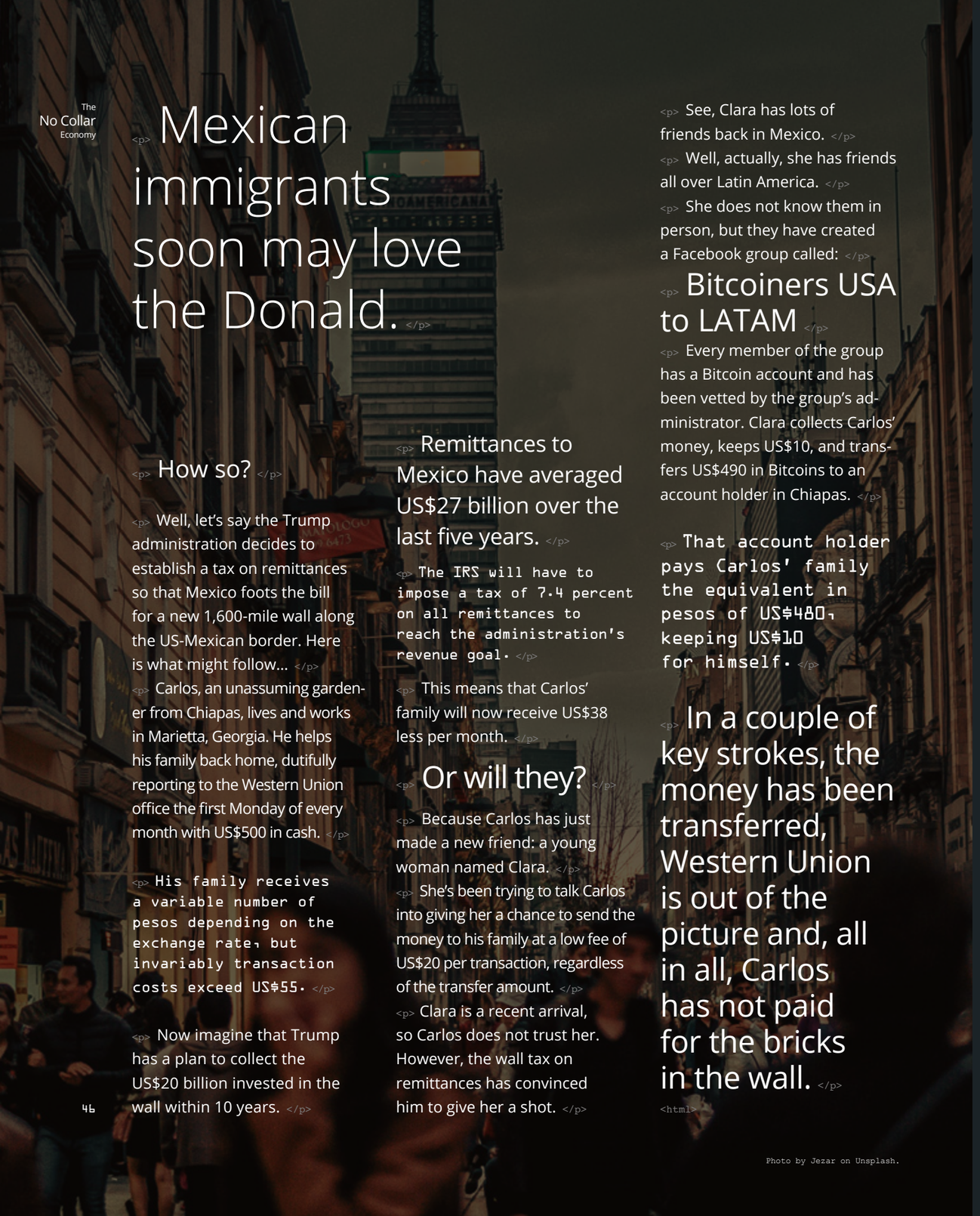
 The impact of FinTech has been generally uncontroversial until now. The developed world has enjoyed the convenience of mobile banking, while automated wealth-management tools (so-called "robo advisors") help middle-class families access financial guidance, and peer-to-peer lending programs open avenues of lending for new start-ups, moneyed families, and everything in between. Meanwhile, emerging markets enjoy unprecedented options for financial inclusion that could allow fast adaptors to leapfrog various steps in financial development.
 But forthcoming innovations could prove far more disruptive, challenging our very notion of money itself, and who controls it. Cryptocurrencies, the digital assets currently not endorsed or recognized by any government or central bank, are at the center of this storm brewing on the horizon. The technology behind digital currencies is dizzying, but the appeal is relatively straightforward.
 The lure harkens back to the days of the gold standard, and the yellow metal may be an apt comparison to a digital asset such as Bitcoin. Both have an intrinsic value independent of any government's monetary policy. There is a finite quantity of gold in the world, and people expend considerable efforts to obtain it.
 Bitcoin is similar, though it is found by mining numbers and not the Earth. Bitcoin miners use high-powered computers to find specific numbers that solve a complex riddle. Successful numbers can earn miners a unique Bitcoin; they strike digital gold, so to speak. There are a finite number of successful numbers, implying a finite number of Bitcoins that can be found and traded, but not be created or destroyed. Newly minted Bitcoins can be registered to a digital ledger, a "blockchain", thus guaranteeing ownership. Holders enjoy the security of a bank without using one.
 Once reserved for settling illicit transactions in the internet's darkest depths, Bitcoin exploded onto international consciousness in late 2013 when the value of a single unit spiked from US$125 to US$979 in a matter of weeks.[37]
 The impact of digital currencies, now firmly entrenched in the public's imagination, if not their investment portfolios, remains to be seen. To proponents, digital currencies are an unstoppable wave, destined to cut out middlemen and banking interests that made conducting business secure but costly. "The day you started earning and spending money is the day you began repeatedly handing over slices of that money to these middlemen," write Paul Vigna and Michael Casey of *The Wall Street Journal*. "Cryptocurrency promises to stop that outflow and put the money back in your pocket."[38] Of course, many people remain unconvinced. They include market drivers who have punished Bitcoin at various times in recent years (*The Economist* labeled it the world's worst performing currency in 2014[39]).
 Just as Paytm or M-Pesa may not dominate forever, the fate of Bitcoin itself is irrelevant. It's the technology behind Bitcoin, the proven ability to create a secure digital ledger without either a bank or a government, that cannot be ignored. FinTech may not be able to profoundly or rapidly disrupt a concept as fundamental as money, but it's already clear that the financing of The No Collar Economy will not solely be in the hands of Wall Street bankers in smart pinstripes or central bankers in nondiscript suits.



Mexican immigrants soon may love the Donald.

How so?

Well, let's say the Trump administration decides to establish a tax on remittances so that Mexico foots the bill for a new 1,600-mile wall along the US-Mexican border. Here is what might follow...

Carlos, an unassuming gardener from Chiapas, lives and works in Marietta, Georgia. He helps his family back home, dutifully reporting to the Western Union office the first Monday of every month with US$500 in cash.

His family receives a variable number of pesos depending on the exchange rate, but invariably transaction costs exceed US$55.

Now imagine that Trump has a plan to collect the US$20 billion invested in the wall within 10 years.

Remittances to Mexico have averaged US$27 billion over the last five years.

The IRS will have to impose a tax of 7.4 percent on all remittances to reach the administration's revenue goal.

This means that Carlos' family will now receive US$38 less per month.

Or will they?

Because Carlos has just made a new friend: a young woman named Clara.

She's been trying to talk Carlos into giving her a chance to send the money to his family at a low fee of US$20 per transaction, regardless of the transfer amount.

Clara is a recent arrival, so Carlos does not trust her. However, the wall tax on remittances has convinced him to give her a shot.

See, Clara has lots of friends back in Mexico.

Well, actually, she has friends all over Latin America.

She does not know them in person, but they have created a Facebook group called:

Bitcoiners USA to LATAM

Every member of the group has a Bitcoin account and has been vetted by the group's administrator. Clara collects Carlos' money, keeps US$10, and transfers US$490 in Bitcoins to an account holder in Chiapas.

That account holder pays Carlos' family the equivalent in pesos of US$480, keeping US$10 for himself.

In a couple of key strokes, the money has been transferred, Western Union is out of the picture and, all in all, Carlos has not paid for the bricks in the wall.

Photo by Jezar on Unsplash.

Chapter 3

The Future of Work

Still with us? Great.

Now let's get down to work...

and we mean it this time!

Because in an exponentially changing world, the jobs we do to make a living are shifting right before our eyes.

Disruption can be mesmerizing to observe even when devastating in consequence: Images of atomic-bomb test runs have captivated audiences since the 1940s. In a similar vein, the technology in that elegant iPhone that so many of us put on a pedestal has the power to put millions of people out of work.

Politically charged debates about international trade may soon become debates on automation. From the cab driver to the bank teller to the sportswriter,

many jobs familiar today will be
the work of computers tomorrow.

And that's not crazy futurist talk -
it's already happening.

Say Cheese!

Foreigners aren't taking the jobs.

Machines are.

And they are getting smarter, faster.

Photo by Ricardo Gomez Angel on Unsplash.

Consider the following three milestones in artificial intelligence:

1997

Deep Blue,

an IBM supercomputer,

defeated chess grandmaster Garry Kasparov in a six-game re-match by 3½ to 2½.

Many consider Kasparov to be the best chess player of all time, but even he had to begrudgingly admit that IBM hadn't cheated. The machine beat him fair and square.[1]

In May 1997, humanity was bested in

strategy.

Garry Kasparov
vs. Deep Blue
Game 1

End.

Kasparov was indeed very angry about it, accusing IBM publicly of cheating. Later, IBM published the logs, and Kasparov got over it.

2011

Watson,

another IBM supercomputer,

crushed Ken Jennings and Brad Rutter in a series of Jeopardy! matches.

Sure, Jennings may hold the record for the longest winning streak in the game's history, while Rutter is its highest earner.

But in February 2011, the real Jeopardy! answer was "Who are two dudes who were beaten by the computer?" as Watson outperformed humans in a

cognitive challenge.

After the game, Jennings wrote "Just as factory jobs were eliminated in the 20th-century by new assembly-line robots, Brad and I were the first knowledge-industry workers put out of work by the new generation of 'thinking' machines."[2]

2016

Alpha Go,

a narrow AI program,

defeated Go champion Lee Sedol in a five-game match of the ancient,

complex board game.

Lee Sedol vs. AlphaGo
Game 1

First 100 moves

Moves 100-186

Despite its simple rules, Go is extremely complex, even more so than chess. Its abstract nature and board size make for more move possibilities than the total number of atoms in the visible universe.[3]

The astounding advances have led to four of the most feared and revered syllables in English…

Images by Wikimedia Commons.

Icons by The Noun Project.

¡Autom ation!

Automation has already caused deep reductions in rich-country manufacturing jobs, and the resulting squeeze on middle classes has led to increasingly exotic political choices.

In the coming years, as machine learning takes center stage, this vice on the middle class could tighten.

Image by Loew's International on Wikimedia Commons.

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So what is the **future of work?**

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 Futurists often foretell a world in which AI, big data, machine learning and automation dictate human life. Some argue that the technological disruption will lead to the elimination of work altogether, or, if we are not careful, robot domination. For others, this change gives rise to a newly empowered professional class that derives its prosperity from coding and the servicing of robots.

 While neither of these visions has yet come to fruition, technology and automation have already laid waste to jobs in manufacturing and are increasingly threatening the bread and butter of well-trained, well-educated workers: jobs in the service sector. Hints of coming labor-market disruption can already be seen in the early-stage disruption of run-of-the-mill service-sector jobs in trucking, retail, investing and even pizza-making.[4]

 Previous industrial or agricultural "revolutions" harnessed work to draw hundreds of millions – perhaps billions – out of poverty. But the automation and technology ushered in by the No Collar Economy will strike at our basic understanding of labor, productivity and fulfilling employment.

 As a result of cutting-edge advances in robotics, AI and machine learning, automation may replace up to 47 percent of American jobs, 57 percent of jobs in OECD countries and 77 percent of jobs in China.[5]

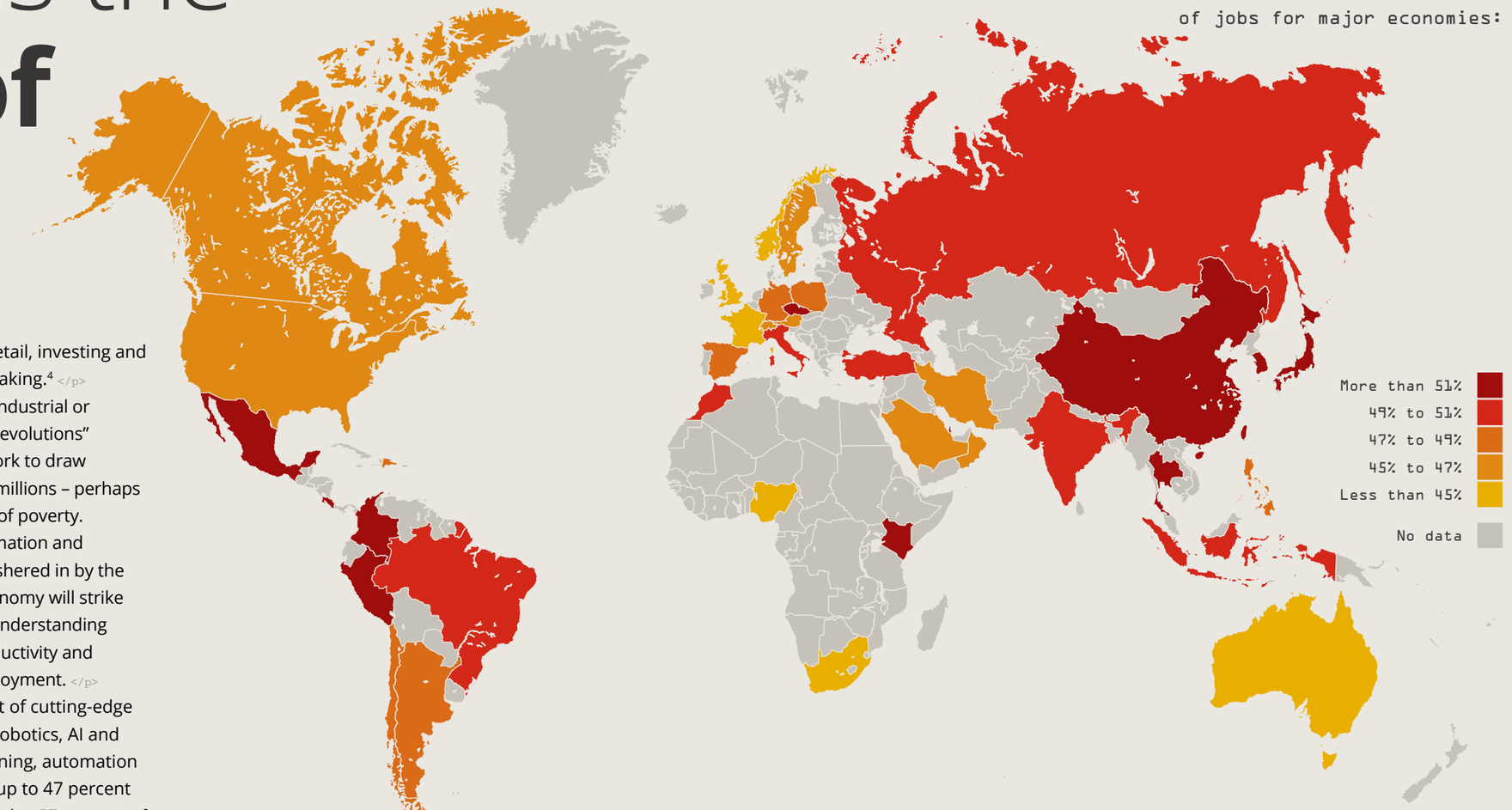
 The result of this process may be greater prosperity, but the interim will almost certainly see painful disorientation and disruption.[6] The introduction of technology and automation is already causing monumental shifts in the way we work. But, unlike previous labor revolutions, there is no guarantee that it can spur the creation of tens or hundreds of millions of new jobs.

 In the United States, the shift in employment is characterized by the rise of the "autonomous economy", in which computers, platforms, big data, robots and AI increasingly drive value creation.[7] The subsequent slow, downward pressure on wages and full-time employment has already caused millions of workers to transition to precarious no-contract, platform-enabled work that offers no fringe benefits.

 Without swift action to equip workers for future labor markets, society may be forced to grapple with ever-spiraling unemployment and inequality.

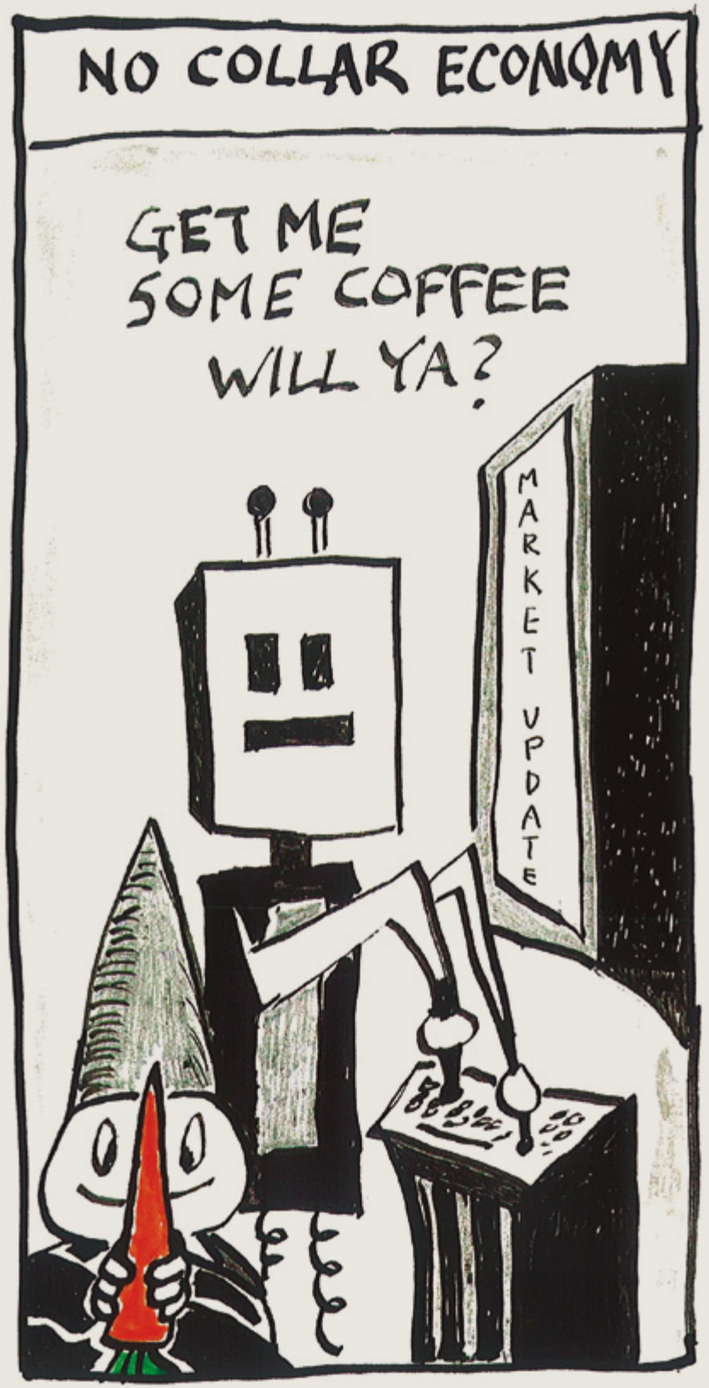
Welcome to the Machine

The World Economic Forum (WEF) estimates the risks of automation of jobs for major economies:



Map by freevectormaps.com

The Evolution
of Work



Is this time really different?

A very short history of four industrial revolutions

To be fair, people have feared the impact of automation and technology for centuries. Although it may not yet be time to throw our shoes at the computer, some believe this time really is different.

Pre-Industrial

10000 BC

Brute strength and sweat served as primary sources of wealth creation for most of human existence. We didn't make money; we hunted food. A good day was a day survived.

Industrial revolutions

1.0
Steam

In the last two and a half centuries, capital emerged as the key to wealth creation. The ability to transform raw materials into manufactured goods generated unprecedented economic growth.

1750

First
Machine Age

While these revolutions made many jobs redundant, they also tended to complement human labor, creating millions of new blue- and white-collar jobs.

2.0
Electricity

The world witnessed illumination as the night became part of the day. New means of collaboration and division of labor were established: After all, the production line would not be possible without electricity, and the internal combustion engine is but a portable electricity plant.

1870

3.0
Computers

The brick and mortar of factories, shopping malls and modern cities attest to a transformation that allowed people to accumulate an inordinate amount of stuff while consuming a myriad of services: The result of globalized value chains enabled by the first age of computers.

1960

4.0
Digital Age

Our new Digital Age also has building blocks, but they are less visible. Bits and bytes form the basis of an economic system in which ideas take center stage, and access can be as important as possession. But the value of goods and services produced and consumed in this No Collar Economy is difficult to measure.

The value is obscured by intangibles such as identity, lifestyle, networks, and data stored in "the cloud."

2000

Cloud computing is an internet-based technology that provides shared computer processing resources and data to computers and other devices on demand.

Second
Machine Age

Such intangibles are not manufactured, they are 'mindfactured'. It may sound silly, but petabytes could soon be more important than petrodollars. So far, machines have made us stronger; the challenge ahead is to learn how we can become smarter with them.

Just look how employment has evolved since the Industrial Revolution.

So this is not our first experience with fundamental disruption. And while previous revolutions made many jobs redundant, they also created hundreds of thousands of new jobs. The fundamental question for the future of work is will this new digital revolution be any different?

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The Rise of the **Bipolar Work Force**

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 The major concern of the No Collar Economy is that it will create a limited number of exhilarating, highly paid jobs for lucky individuals with access to skills training, higher education and elite networks. Meanwhile, most other work could be low paid and require little education. This could engender a bipolar work force, exacerbating the inequality that already marks the 21st century.

 Such a bifurcation would be unique to the digital revolution. Previous waves of technology and automation tended to complement human labor, resulting in higher output per worker while generating fresh demand for goods and services. The installation of 400,000 automated teller machines (ATMs) in the US since the 1970s, for example, paradoxically resulted in an increase in the number of bank tellers.[8] ATMs lowered the cost of maintaining individual bank branches, and allowed tellers to focus on higher value "relationship banking" involving complex interpersonal tasks that, for the moment, cannot be easily automated.

 So, why does the current wave of technology and automation differ from previous waves? First, the types of jobs affected differ from those of yesteryear. In 1960, one in four American workers was employed in manufacturing. It's one in ten today. But the integration of technology created service-sector jobs because it tended to complement human labor. The exponential rise in service-sector employment, which now accounts for 80 percent of US jobs (as opposed to fewer than 50 percent five decades ago), generated opportunities for workers in the manufacturing sector displaced by technology or globalization.

 This economic transformation has resulted in an overall US unemployment rate of just 4.4 percent.[11] But it has also created a bifurcated labor market, one characterized by a small number of high-wage jobs requiring advanced skills and many low-wage jobs requiring little skill. The disparity has contributed to wage stagnation across the OECD.[12]

 More than half of new jobs created in the US since 2010 have been concentrated in lower-wage service-sector positions in, for example, food service and home healthcare. These pay less than the annual median household income of US$52,000.[13] At the same time, the number of jobs requiring above-average education, training and experience increased more than 68 percent between 1980 and 2015.[14]

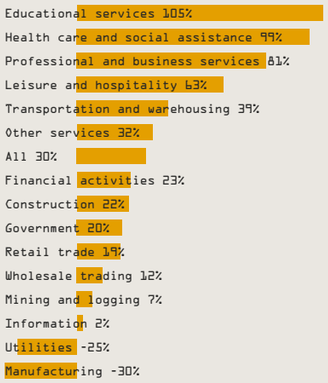
A 2013 study by Carl Benedikt Frey and Michael Osborne cautioned that taxi and delivery drivers, receptionists, cashiers, accountants, and security guards are most vulnerable to automation.[9]

It's not just Americans who are losing manufacturing jobs. From 1990 to 2014, manufacturing jobs fell by 25 percent in Germany, 33 percent in France, 33 percent in Sweden, 34 percent in Japan and 49 percent in the UK. In the same period in the US, jobs in the sector dropped 31 percent.[10]

 In other words, the early years of the No Collar Economy witnessed most job growth at the very top and the very bottom of the quality spectrum.
 There is an ever-growing gap between high- and low-skilled workers in this environment. So even without massive job losses, automation and technology may exert slow but continual downward wage pressure, leading to a vicious cycle of further labor-market divergence.[15] The ride-sharing company Uber may create worldwide a few thousand high-end jobs that offer big money and cheese plates to the upper echelon of coders, advertisers and lobbyists that can keep the company rolling, so to speak. But it depends on an army low-wage, low-skilled driving positions (which themselves will exist only until self-driving cars take over).
 The societal effects of this may already be appearing. A growing gap between those with skills, income, education and jobs and those without is being blamed for declining rates of marriage, reduced happiness, opiate abuse and even the election of Donald Trump.

Over the past 25 years, employment growth has been most rapid in education and health services

% change in indutry employment, 1990 - 2015



Note: "All" dos not include farm employment.
Source: Pew Research Center analysis of US Bureau of Labor Statistics Current Employment Statictics survey WThe State of American Jobs".

A No *Contract* Economy

 So what does the future of work look like for folks lacking elite networks and degrees?
 Many workers displaced since the 2007 financial crisis have sought opportunity in a booming on-demand economy facilitated by online platforms, which act as a digital means of exchange in the No Collar Economy. By leveraging cloud computing and algorithms, these platforms facilitate the exchange of goods (think Etsy), services (Airbnb) and even capital (Kickstarter) among individuals and groups. Companies such as Amazon, Facebook, Salesforce, Uber, TaskRabbit and UpWork vie to construct and optimize massive ecosystems that harness the network effects and cost efficiencies of millions of workers competing to complete a task, sell a product or provide a transportation service.
 While the development of platform-enabled exchange is still in its infancy, recent trends highlight the crucial role that platforms will play in the future of work. As of 2015, 15.8 percent of the US workforce was engaged in "alternative work arrangements" as "temporary help agency workers, on-call workers, contract workers, and independent contractors or freelancers."[16]
 Furthermore, the number of participants in the digital market is expanding at an exponential rate, increasing 47-fold from October 2012 to September 2015. Tellingly, the marketplaces spawned by platforms have attracted the same demographic that has lost the most from digital revolution: yesterday's factory worker is today's Amazon packager. Platform workers tend to be young men with low incomes.[17]
 Such "contractors" are often ineligible for social protections such as unemployment insurance and social security, and their bargaining power is being eroded by new ways that digital platforms allow buyers and sellers of goods and services to connect. In other words, our Uber driver doesn't have a lot of leverage given that half his block drives for the company, and that driverless cars are coming soon. Longstanding norms regarding pay equity have been replaced with a culture of permanent insecurity, with potential long-term implications on emotional well-being and life expectancy.[18]
 Millions of on-demand workers may soon rely for their livelihoods on platforms that paradoxically wield immense control over this dispersed – yet digitally connected – labor force. Uber is already using so-called "gamification" strategies, which leverage big data to incentivize drivers to continue taking customers when they would rather take a break or end their working day.[19] We could be approaching a future in which tens of millions of workers in the on-demand economy are managed not by companies or supervisors, but by big data and data scientists.
 The proliferation of on-demand platforms in the industrialized world raises a raft of questions that policymakers must address: Can the platform economy connect buyers and sellers to maximize growth and jobs? Will platforms inevitably find ways to monopolize their ecosystems for maximum profit?
 Meanwhile, the no-contract economy could be a winner for the developing world. The economic argument is familiar: Just as emerging-market manufacturers were able to work for less cost than their Western counterparts, editors, designers and graphic artists in developing countries will be able to offer lower prices for their services on global platforms.
 Consider the company Fiverr, whose idea is simple enough. Clients post requests for one-time jobs, such as designing a logo or configuring a catchy business card. Freelancers then bid for the job for as little as US$5. It's a global market, but there's no global purchasing-power parity. A five spot might buy dinner in Thailand, but it won't even get you a Guinness in Washington, DC.
 Given demographic expectations, emerging markets may contribute up to 500 million more workers to the global working-age population by 2030, and they will be able to take advantage of the platforms and advances in manufacturing technologies that will allow buyers and sellers to connect in new ways. Such platforms can break down barriers to entry that previously prohibited citizens of emerging markets from engaging with the global economy. The introduction and scaling of new technologies may also allow emerging markets to skip critical steps in the arduous process of industrialization, in effect allowing their workers to move onto an equal footing with their no-contract counterparts in the developed world. This explains why leaders such as India's Narendra Modi take broadband penetration and digital platforms so seriously.

Gamification.
To apply game-design elements and game principles to non-game contexts, improving user's engagement. The resulting ease of use generally results in higher productivity, better learning experiences, activation of crowdsourcing, and the generation of a lot of valuable data for all sorts of purposes.

From 2011 to 2015, mobile broadband penetration in India skyrocketed from 1.9 active subscriptions per 100 inhabitants to 9.36.[20]

 Given these trends, we need to refocus the crux of our policy debates. Developed-world attention since the 2007 financial crisis has concentrated on the decline in manufacturing employment. But this only accounts for 8.6 percent of American jobs. And as much as the folks in Ohio or Pennsylvania don't want to hear it, manufacturing jobs are highly unlikely to return (and it would be machines doing the work *if they did* return). Attention must instead focus on the digital revolution and developments in automation and technology. They, after all, represent the threat to the low- and mid-level service-sector jobs of tens of millions of Americans.
 A wall along the Rio Grande is not going to block "the cloud".

<h2>

Case Study: Automated **Retail**

</h2>

 The retail sector is a pillar of the US economy. More than 16 million Americans, 10 percent of the country's workforce, are employed as cashiers, salespeople, stock clerks and customer service representatives.[21] An additional 25 percent of all American jobs, in related sectors such as logistics and marketing, are supported by the industry.[22] Although the US Department of Labor predicts that retail-sector employment will grow at a healthy seven percent between 2014 and 2024, those jobs are highly susceptible to automation and technological disruption due to the scale of the market and early advances in automated retail technologies. This highly competitive sector is ripe for widespread disruption even if policymakers are largely unaware of it.

 Areas that until now have been impervious to the changes wrought by e-commerce will be affected. The threat is perhaps most clearly seen in the grocery sub-sector, which employed 856,850 Americans in 2015. Just one percent of sales in this US$1.5 trillion sector have moved online to date, sparing supermarkets from large-scale disruption.[23] That may soon change.

 Amazon Go concept stores, which eliminate cashiers and checkout lines for real-time inventory management, smart shelves and smartphones, threaten to transform how consumers shop – and how millions of low-wage service-sector workers make a living. Amazon Go stores are operated by an average of just six workers compared to an average of 72 at an American grocery store.[24] The Amazon Go model is still being refined, but the company plans to roll out its automated establishments in 2,000 or more US locations.[25]

 Workers displaced by this automation may secure similar employment in the labyrinth of warehouses and logistics set up by e-commerce retailers. But even here the potential for automation could threaten these jobs, thereby reinforcing the significant and multiple disruptions the retail-sector workforce faces.

Photo by Tom Sodoge on Unsplash.

So—quite literally—what are we going to do?

 A big part of preparing for the No Collar Economy lies in education. Not just more education, but the right kind of education.

 We need to devise a radically different approach to adapt to a radically different world. We must develop new skills, with lifelong learning at the core of the strategy.

 After all, the one certainty today is the uncertainty of tomorrow. The modern workforce must be capable of rapid adaptation and flexibility to remain relevant.

 Grandpa's inability to use Facebook may be funny today, but it's no joke if, in a few years, 40-year-olds can't keep up with technological progress.

 We could also see a greater emphasis on jobs that machines still can't do and probably won't be able to do for some time. For example, in the Orange Economy: the intangibles anchored in artistic and creative talents. Others have pointed towards "service sectors of love", such as assisting older folks.[26] But it's difficult to fathom how these sectors can create mass employment.

 Labor-market disruption wrought by the future of work is a first-order policy challenge. As policymakers and the public struggle to grasp how this disruption will affect their lives, the need for concrete solutions is becoming apparent. Yet there is little consensus on how to go about designing them. A 2016 poll by the Pew Research Center found that 65 percent of American workers believe that robots and technology will "definitely" or "probably" replace much of their work within the next 50 years, while 80 percent also believe that their individual jobs would "probably" or "definitely" still exist.[27]

 With the value of human work being squeezed by the rise of a bipolar economy and the introduction of automation and technology, how can policymakers and workers prepare for the future of work?

 As in previous industrial revolutions, our current approach places great emphasis on the ability of education and training to transition workers to the jobs of the future. But is education enough? While it has proven effective at upgrading skills for higher-level jobs, relying too heavily on training poses two main obstacles. First, training and education are slow in transitioning workers to other fields, and many older workers may be incapable of retraining and reskilling for millennial-dominated positions in coding and data scraping. Second, what happens if the future of work diminishes the amount of work available? We could be faced with a situation in which we continue to churn out educated and well-trained workers who can no longer access employment, further compounding the problem.

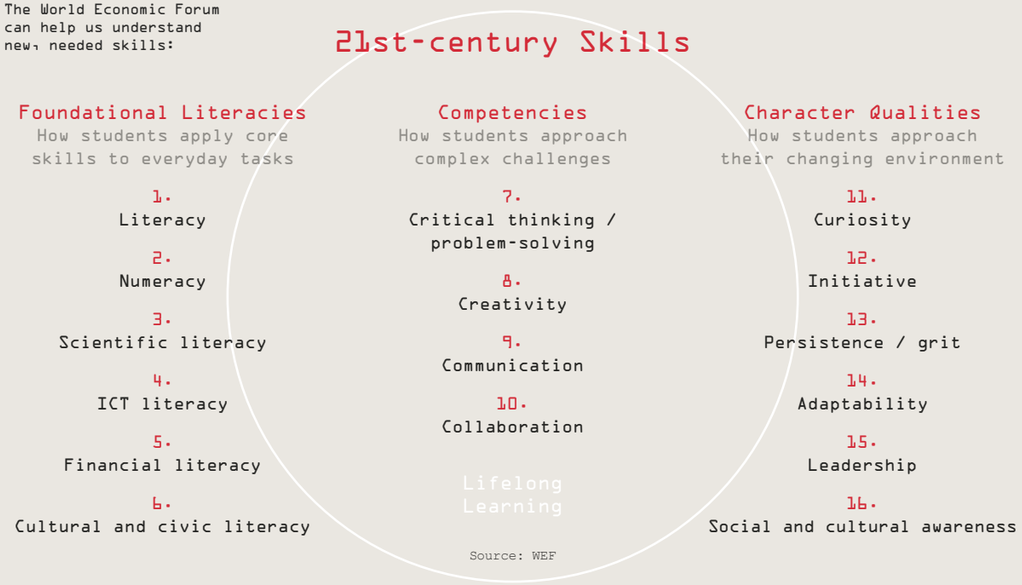
 Perhaps employers need to pick up some of the slack and play a greater role in upgrading and updating workers' skills. The dominant employer-employee relationship of the past is no longer relevant. Lifelong learning, personalized skills counseling, and the creation of frameworks for employees to act with

greater autonomy and creativity represent the way forward.[28] This could be challenging in an era of platform-based employment, where the app is essentially the employer. In some countries, such as Germany, policy makers are atttempting to regulate platforms to ensure they feature opportunities such as lifelong learning. There is no similar movement in the US.

 Meanwhile, others are thinking outside the box. Tech luminaries such as Mark Zuckerberg and Elon Musk have channeled Thomas Paine to revive interest in alternative income schemes and "universal basic income" (UBI) that decouples wage earning from work. With UBI pilot projects already under way in Finland and Oakland, California, some believe workers will finally have the freedom to spend less time on work and more time with family and community.[29] UBI may provide sustenance for all, and it would also revolutionize our perceptions of work, wealth, and a life well lived.[30]

 All, some or none of the aforementioned policy responses may eventually be adopted. A well-measured approach, however, remains an imperative.

The World Economic Forum can help us understand new, needed skills:



 At the very least, it gives us something to work on.

Chapter

Crowd-pitalism

Big Dollars and Big Data

Who wants to be a billionaire?

Yes, with a "b".

But not necessarily with Benjamins.

Photo by Wikimedia Commons.

Unlike contestants in the famous television game show of a similar name, today's billionaires are not all about the money.

In the No Collar Economy, a billionaire might be just as likely to set their sights on reaching a billion people:

Just as peta-bytes and not petrodollars could be the building blocks of the future

(see The Future of Work),

amassing data and expanding outreach could be a vital aspect of wealth creation.

From setting up social networks to tackling climate change to providing potable water and medical supplies in remote parts of the world, a new breed of entrepreneur has emerged.

The shifting notion of being a "billionaire", from collecting a billion dollars to impacting a billion people,

comes from the very nature of

digital technology,

and the trend has been evident for some time now.

Remember Atari?

(Google it, millennials)

Way before billions of people began streaming any song under the sun on Spotify, before they could share those college party, then wedding, and then baby photos on Facebook, and before they could get "together" to play in massive online worlds like World of Warcraft, there was a world where an engineer—a developer—was not a rockstar.

 When Atari, the company that invented home interactive entertainment, went bankrupt after a series of flops in 1984, a whole new industry faced the brink of extinction.
 Happily, the likes of Nintendo and Sega held the fort during the 1990s until peer-to-peer networking came along at the turn of the century.
 The world changed for good. Ever since, becoming a "digital millionaire" in terms of subscribers could also make you a dollar millionaire as companies learned to monetize their outreach.

 Ladies and Gentlemen, welcome to the era of Big Data.
 Google and Facebook—just to name a couple of the largest—advertise just as television and radio did. But unlike traditional broadcast media, these internet giants have far more information about potential customers.
 They can identify the specific behavior and preferences of each one of us.

 Spotify knows what we want at any given moment, because it knows we just searched for "I Want It That Way" by the Backstreet Boys.

It's still a jam.

Ladies and Gentlemen,
welcome
to the era of
Big
Data.

Photo by Ben Neale on Unsplash.

What is data?

Your digital footprint is marked by data.

Every Google search, every Facebook profile, every Amazon order creates a record, a point of light in an enormous constellation of personal data we make available to the world. Anytime anyone clicks, snaps, programs, taps, swipes, uploads, saves, or downloads, they generate information. Whether for work, entertainment, socializing, or... ahem... "other", all our digital interactions create strings of data that record our relations with one another and with digital content.

Data.
Perhaps one of the oldest human obsessions. From Inca knot-counting systems that recorded demographic statistics to the decrepit filing cabinets beneath the US Treasury, people have turned to record-keeping in an effort to impose order on a chaotic world.

Here is a typical day in "the cloud":[1]

36 million
Amazon purchases

152 million
Skype calls

186 million
Instagram photos

803 million
Tweets

2.3 billion
gigabytes of web traffic

8.8 billion
YouTube video views

4.2 billion
Google searches

207 billion
e-mails

Photo by Barret Lyon on The Opte Project.

The Incas couldn't track this with their knot-counting system.

The ability to analyze big data is particular to the No Collar Economy. The information available is not millions but billions of entries, often capturing trends in real time. In previous generations, so much raw information would have been useless. We lacked the ability to analyze it. But massive data centers can now handle it.

These big-data facilities are hauntingly inconspicuous: windowless, dull warehouses often located in the middle of nowhere. Yet inside the sterilized corridors, cool air refrigerates tens of thousands of computers that crunch, plug and extract flows of data in search of trends, insights and information.

What they find is extremely valuable.

Computers use these observations to separate patterns from noise, and to create models capable of providing client-specific services: from finding your best route to work to picking the most prominent posts you see on Facebook; from the new music Pandora thinks you will like to the travel book for that vacation Amazon realizes you need; even the romantic comedy that Netflix knows you want to watch (even if you won't admit it to anyone else). All such decisions are guided by what models know about you, and what the models know about everyone else.[4] The more data available, the more likely the model is to offer exactly what you want, even if you didn't realize you wanted it.

Has data become the coin of the realm?

In 2012,
Facebook acquired Instagram for

US$1 billion,

paying roughly

US$30

for each of the photo-sharing app's

33 million users.

This was just an appetizer:

In 2014,
Facebook acquired
WhatsApp for

US$19 billion;

US$30

for each of the messenger service's

600 million users

at the time.

In other words, your personal data has become a commodity. And, on average, access to your digital self isn't worth much less than a barrel of oil.[2]

Icons by The Noun Project.

Crowd pitalism

kraʊdˈpɪtəˌlɪz(ə)m

n.

An economic system where crowd-generated-data is the critical commodity for value creation.

Photo by Louis Lo on Unsplash.

Creating Value

In principle, modern factories are not too far removed from those of the past. They receive raw materials and parts, and they produce new stuff.

However, the value-creating aspect of the manufacturing process has shifted.

In the No Collar Economy, assembly adds less value than it once did.

Meanwhile, "soft" activities such as design, supply-chain management, and servicing add much more.[3]

Value increasingly depends on knowledge added from beyond the factory floor.

The materials used for making a 32 GB iPhone 7 cost US$225. Assembling the phone in China costs a mere additional US$5. Apple captures the bulk of its profit from the device's retail price of US$649 because it controls the intangibles that make it valuable.[4]

Just look at how today's West Coast stacks up with 1990s Motown:[5]

Top 3	Detroit (1990)	Silicon Valley (2014)
Type of companies	Car manufacturers	IT
Market capitalization	US$36 billion	US$1.09 trillion
Revenues	US$250 billion	US$247 billion
Employees	1,200,000	137,000

 Why does market cap differ greatly despite similar revenues? Sure, Silicon Valley's bottom line is helped by having far fewer employees. But that can't be the whole story.
 Let's look under the hood. General Motors, Ford and Chrysler (Detroit's big three) may keep an inventory of raw materials, parts and vehicles. But this stash is relatively expensive to store, and the longer the inventory is held, the less it is worth.
 Silicon Valley's tech giants, on the other hand, store data. This is relatively inexpensive to keep. And the more you store, the more valuable it becomes - for companies and their clients. The economics of networks means that information on each additional person adds value to the experience and possibilities of those already in the networks.

The oil barons have been replaced by the whiz kids of Silicon Valley

The World's Largest Public Companies
By Market Capitalization (US$ Billions)
Source: visualcapitalit.com

Tech
Other

 Facebook becomes more valuable as more people use it and the company manages more data. In other words, the inventory appreciates.
 Big Data has flipped the definition of value. Just 20 years ago, no IT company ranked among the world's top five in terms of market capitalization. Now the top five are all IT-based.[6] The business model of three of them (Alphabet, Amazon and Facebook) is heavily reliant on Big Data analysis and the ability to engage a large and heterogeneous community of millions or even billions of people. The models of the other two, Apple and Microsoft, are increasingly dependent upon such analysis.

Big Data & The Crowd

Data can seem to make money appear out of thin air. Facebook is worth billions of dollars even though the only thing it makes is "friends".

But are we leaving meat on the bone?

Data specialists figure that only 0.5 percent of data generated over the internet is mined to create value. Most "Internet of Things (IoT)" data is not crunched. Only one percent of data collected from an oil rig with 30,000 sensors, for example, is examined. And that collection is used primarily for anomaly detection and control. Optimization and prediction, which provide the greatest value, are overlooked.[7]

Now consider that the amount of data exchanged online doubles every two years. That's about the same rate of exponential change that the number of transistors in a microchip has undergone, as described at the beginning of this book.

Most of this data sits idly in massive data centers. Like oil deposits underground, it waits to be extracted, refined and used.

More than
90%
of mobile data traffic will come from
smartphones
in 2022.[8]

Yes, data is **THE** commodity of the No Collar Economy!

And it is underexploited.

The possibilities for wealth and welfare creation are limitless.

So, who is generating
so much valuable and underused data?

You guessed it:

the crowd.

The crowd wears, carries and installs devices that passively and actively record data on everything happening around us. It's our avid consumption for connected devices that pushes the exponential growth in data.

For every human connected to the internet today, there are roughly two connected devices.

That's some

eight billion

gadgets assisting our digital selves.

About half of them are smartphones. The other half are desktops, laptops, cameras, robots, watches or sensors of some sort.

By 2020,
the number of devices connected to the internet could surpass

50 billion.

That's seven devices
for every human.

And by 2050,

one trillion

devices could be connected to the internet.

That's one hundred devices for every human.[9]

The vast majority of them will be

"invisible".

It is not that they won't be able to be seen. Rather, they will be ubiquitous, autonomous and unnoticed. They'll be:

Home appliances
Vehicles
Clothing
Windows
Furniture
Traffic signs
Light posts

To take full advantage of the possibilities of a data-based economy, we must challenge core beliefs of individuality, privacy, collaboration, work-life balance, and how we provide and consume goods and services.

Icons by The Noun Project.

Touring the Data Factories

Generating, capturing, storing and analyzing data lies at the heart of the digital economy. The World Economic Forum identifies 12 key emerging technologies as particularly disruptive:[10]

3D printing. Synthesis of physical objects using a widening range of materials; innovations include 3D bioprinting to create synthetic tissues and organs.

Advanced materials and nanomaterials. Creation of new materials; breakthroughs include thermoelectric properties, shape retention and new mechanical functionality.

Artificial intelligence and robotics. Development of machines that can substitute for humans, increasingly in tasks associated with thinking, multitasking, and fine motor skills.

Biotechnologies. Innovations in genome editing, gene therapies, and other forms of genetic manipulation and synthetic biology.

Energy capture, storage and transmission. Advanced batteries and fuel cells, orbiting solar arrays, tidal energy capture, smart grid systems, wireless energy transfer.

Blockchain and distributed ledger. Cryptographic systems that manage, verify and publically record transaction data; the basis of "cryptocurrencies" such as Bitcoin.

Geoengineering. Technological intervention in planetary systems, typically to mitigate effects of climate change by removing carbon dioxide or managing solar radiation.

Ubiquitous linked sensors. Also known as the "Internet of Things". The use of networked sensors to remotely connect, track and manage products, systems, grids, etc.

Neurotechnologies. New methods such as smart drugs, neuroimaging, bioelectronic interfaces that allow for reading, communicating and influencing human brain activity.

New computing technologies. For example: quantum computing, centralized cloud computing, neural network processing, biological data storage and optical computing.

Space technologies. Developments allowing for greater access to and exploration of space, including microsatellites, reusable rockets and integrated rocket-jet engines.

Virtual and augmented realities. Sophisticated immersive environments, from holographic readouts to complete virtual interfaces.

In one way or another, these technologies reinforce the transition **from a commodities-based economy to a data-based economy.**

Photo by SpaceX on Unsplash.

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Getting **Your Data's** Worth

</title>

 At this point, it would be fair to ask:

"So, what's in it for me?"

 After all, Facebook makes money off your data. Google, Spotify and Twitter, too. So where's your piece of the action?

 The answer remains to be seen. But one truism will hold as we transition from the old economy to the No Collar Economy: There is no free lunch.

 Some people still watch free-to-air television, but they pay for it by viewing commercials. Access to the free-of-charge social networks also involves an exchange. You pay by supplying your personal data instead of your dollars.

 But since this data has value, it is reasonable for us to demand our cut.

 Here is where developing our digital identities — no, not just a LinkedIn profile — is key to ensuring a more equitable Crowdpitalism. One concept is to develop secure and unique digital identities linked to all the data an individual generates online and offline. Such a tool could help people manage what, with whom, how, and at what price such data is accessible.

 Implementing such digital identities won't be easy, nor will it be possible without further developments in Distributed Data Ledgers (DDL), more commonly known as blockchains. These are keys to a digital environment where we can retain ownership of our data and share it only with those who have our consent to access it.[11]

 As more firms battle to be digital billionaires, the race to access our data will become increasingly competitive. But individuals will remain only race spectators as long as they continue to view online platforms as "free."

 So until we find better ways to monetize our own info...

</html>

KEEP CALM AND PROTECT YOUR DATA

1

Take responsibility for keeping a proper backup of your digital information.

2

Don't store all your passwords (Yes, plural! Do not use the same one for everything!), biometrics and sensitive information in one place. Take advantage of the several cloud services now competing for your vacation photos.

3

Double check before granting unfettered access to your social-media accounts to friends, partners or the latest cool app.

Overall, treat your data like your life depends on it.

Because in the No Collar Economy it does.

Chapter 5

Digitization and Global Trade

Visualizing the digitalization of trade is not easy.

After all,

percent

of goods traded
across borders travel,
in part, by sea.[1]

And many of us are amazed
at the sight of

massive tankers

that daily deliver more than

40 million barrels of oil;

or the football-field-sized New Panamax ships,

each carrying up to 15,500 containers, enough capacity to move

four and a half years' global supply of iPhones;

or the US Navy and its 11 carrier groups

that protect the world's shipping lanes and their eight choke points:

**Panama,
Suez,
Gibraltar,
Malacca,
Denmark,
Hormuz,
Bab-el-Mandeb,
Bosporus.**

Photo by Zoltan Tasi on Unsplash.

In our minds, international trade arrives and departs on ships, **not online.**

So, to help dematerialize our trade mindset, let's take it slowly. Or, as Justin Bieber, Luis Fonsi and Daddy Yankee sing...

"savor every moment slowly, slowly…"

and

"pasito a pasito, suave suavecito..."
"muy despacito… despacito"

Wait, we're getting off topic...

... or are we?

The song Despacito has become the most streamed tune of all time, the first song to break the

five-billion

threshold for combined global platforms such as Spotify, Google Play and YouTube.
And Despacito is just the tip of the iceberg.

In 2017, the world saw

US$7.8 billion
in digital music sales[2]

US$18.3 billion
in revenue for business intelligence and analytics software markets[3]

US$77 billion
in revenue for mobile-app downloads[4]

US$247 billion
in public cloud services[5]

US$2.3 trillion
in global e-retail[6]

A lot of these transactions occur within a country's borders.

But what borders does the internet have?

When someone in Spain streams "Despacito", a song performed by Canadian, American and Puerto Rican artists for a California-based record label, this is a services export, and a border is crossed.

This is trade.

In fact, the numbers above reflect expanding global online value chains. Just as nine countries are involved in the production of a new Boeing 787 Dreamliner,[7] Google's product creation and delivery involve people working in 50 countries.[8]

Photo by João Silas on Unsplash.

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Digital Trade **101**

</title>

 The patterns of global trade depend on the availability and price of production factors. Since automation and digitization are already changing the costs of production factors, it is only natural that we see a corresponding change in global trade dynamics.

 Automation is capital intensive and reduces labor costs, while digitization lowers information and communication costs, and makes capital and labor production more efficient. According to traditional economic theory, increased efficiency should translate into increased returns, in this case for labor and capital.

 How will these fundamental changes impact global trade? Five key factors of international trade help us forecast the outcome:

<h1>
1. Proximity
</h1>

 Newton's equation for gravity remains relevant to trade. The force of attraction depends on the mass of two bodies and the distance between them.[9] If we substitute mass with market size, and we continue to use physical distance (controlling for a few additional factors such as shared histories and languages), we can obtain a surprisingly accurate prediction of the trade flows (or attraction) between two geographical entities.

<h1>
2. Resource Availability
</h1>

 The buying and selling of raw materials comprises a share of global trade. They are transported from countries in which they are abundant to countries in which they are scarce. In many cases, developed countries import raw materials from emerging markets. Similarly, high-tech goods and services might be abundant in developed countries and in demand in developing countries. This creates trade flows in the other direction.[10]

<h1>
3. Comparative Advantage
</h1>

 This concept hasn't changed since your freshman year in college. A country enjoys a comparative advantage in the production of a certain good if that country is *relatively* more efficient than another in producing that good. By focusing on areas in which they are relatively more efficient, both countries are better off.[11]

<h1>
4. Intellectual Property (IP) Rights
</h1>

 Such rights are already an important issue in global trade, but they become critical in a digitalized economy. And they go beyond patents or copyrights. Holding IP rights is as important as employing them optimally. The balance between protection and use is critical, as evidenced by the potential gains of Open Innovation and Open Source versus the risks of brand counterfeiting and copyright piracy.[12]

<h1>
5. Private Data Protection Policies
</h1>

 Data privacy and security are thorny issues for governments, which must formulate policy for data collection, access, usage and consent, especially for data generated in public spaces. Restrictive policies and the threat of hackers (domestic and international) may render data flows valueless, as data collection and sharing are key to realizing the full economic value of Big-Data analytics and the Internet of Things.[13]

Photo by chuttersnap on Unsplash.

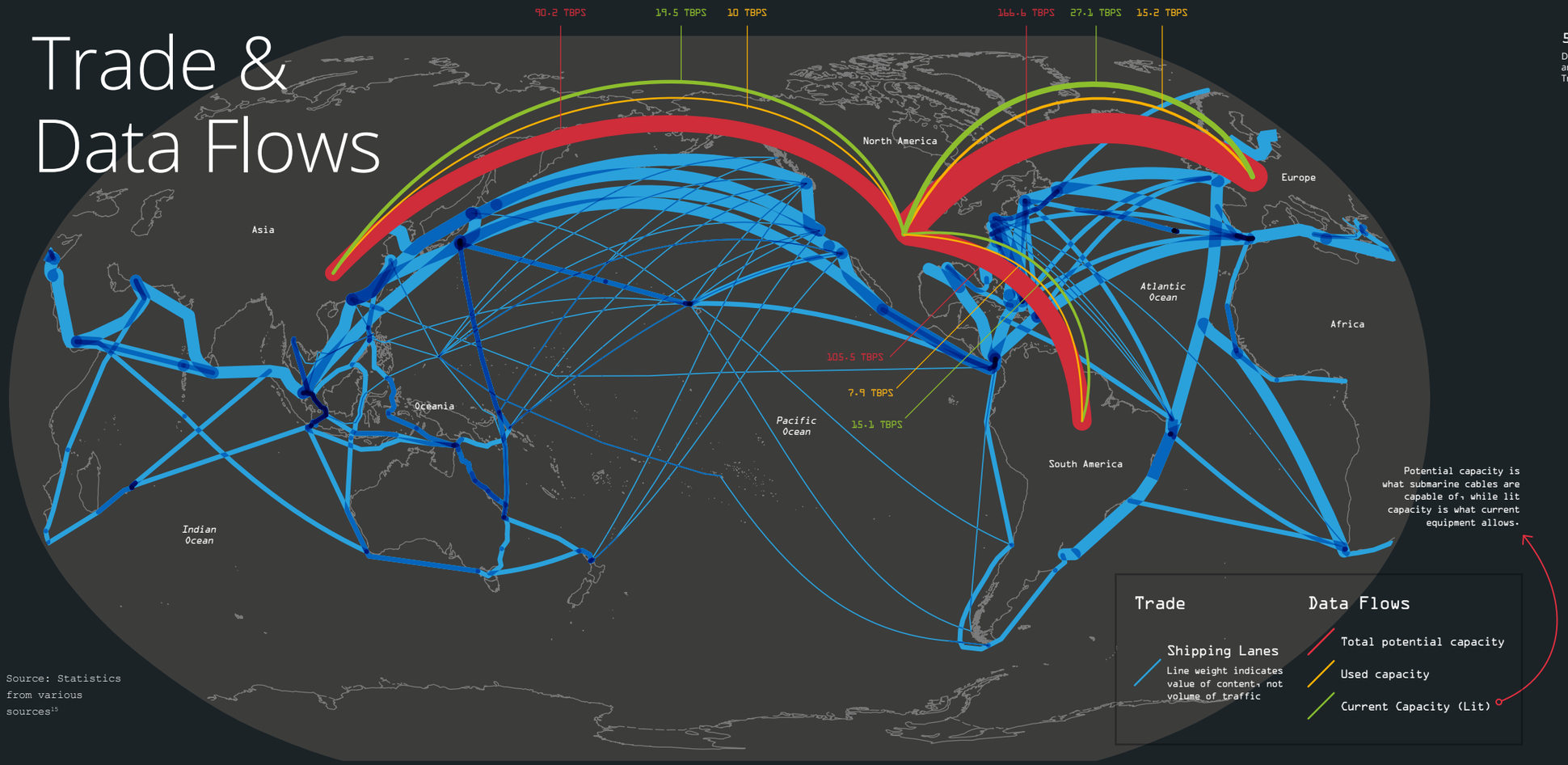
Trade & Data Flows

 In the second half of the 20th-century, important developments changed the geography of trade flows. Lower transport costs and the dismantling of many trade restrictions through the General Agreement on Tariffs and Trade (GATT) and, later, the World Trade Organization (WTO) led to smoother international trade. This included easier movement of technology and capital, both key production factors.

 As a result, developed countries increasingly outsourced industrial production. Low transport costs, the transferability of technology and capital, and the availability of cheap labor in emerging markets made producing goods in the developing world more attractive. The result was deindustrialization in countries such as the US, and a decline in well-paid blue-collar jobs.

 Conventional wisdom around the turn of the millennium held that developed countries needed to specialize in services or high-skilled elements of the manufacturing supply chain since these countries could not compete with the low wages commonly paid to industrial workers in the developing world. But the No Collar Economy calls into question this division of labor. Some experts now forecast that industrial production is likely to return to developed countries.[14]

 Why might this be?



Source: Statistics from various sources[15]

Cross-border trade

US$26 trillion total annually

Digital Trade, 2005-2013

- E-commerce in goods trade: from 3 to 12 percent of total trade
- International calls using Skype: from 3 to 39 percent

Services

- US exports of digital products represent 70 percent of its services trade surplus
- Growth in knowledge-intensive goods trade is currently 1.3 times faster than in labor-intensive goods

Goods

- 2.7 percent growth in volume (2015-16)
- 14 percent decrease in value (2015-16) to US$16 trillion
- 90 percent of commercial sellers on eBay export to other countries, compared to less than 25 percent of traditional small businesses

Submarine cables make the internet global.

Their layout follows the same pattern as the major shipping lanes for global trade in goods.

They are capable of transmitting 211,000 gigabits per second over 880,000 kilometers of cables

+52.9 percent cross-border dataflow growth (average per year 2005-14); 45-fold increase in just a decade!

US$46.3 billion invested in 347 submarine cables (1998-2016)

US$7 billion invested in 40 new submarine cables in 2017-18

US$450 billion added to global GDP each year by submarine-cable flow

For every day that a country loses internet connection, its economy loses US$2.36 per person

The cost of trade

International averages to reach US

- TV set - US$10
- 100 pounds of coffee - US$6.80
- DVD player - US$1.50
- 6 bottles of whisky - US$0.90
- 1 Barrel of oil - US$0.80
- 1 Full print of Wikipedia (in 18,750 volumes weighing 28 tons) - US$1,900

To stream (globally)

- 10 tracks on iTunes - $0.001
- 1 gigabite of data - $0.03
- Netflix HD movie - $0.09
- All Wikipedia's +45 million articles in +270 languages with all associated media
  - Compressed - $3
  - Uncompressed - $690

Map by University of Texas Libraries.

mation. Labor costs are, therefore, no longer a major consideration for determining the location of production. Instead, other factors have become more important. Time-to-market is probably the most important, as consumers are growing ever more accustomed to getting what they want, when they want it. A consumer with 20 options on Amazon will not wait weeks for production and they may even pay more for quicker delivery.
 Another critical development is digital customization, which enables more specialized or personalized production. German sportswear producer Adidas, for example, offers customized running shoes, which are produced in an automated "speed factory" in Germany to avoid weeks of shipping from the production site to the retail market.[16] Intermediate industrial products are also increasingly customized and produced to meet end users' needs. But this kind of flexibility requires high-quality physical and digital infrastructure, both of which are more easily available in the developed world.
 Should the re-industrialization hypothesis bear fruit, industrial production will again increase in the developed world. Emerging-market production will receive some boost from increased local consumption, but the developing world would be unlikely to remain a center of production for personalized goods.

And what about drones?

Domino's Pizza is already delivering pizza with drones in New Zealand,[17]

while 7-Eleven performs drops in Reno, Nevada,[18]

and Chipotle flies burritos to hungry students in Virginia.[19]

The potential impact of drones goes beyond high-in-the-sky access to munchies, and it could quickly expand to delivering emergency food, medicine and supplies to disaster zones and isolated areas worldwide.

It's a brave new frontier for humanitarian relief.[20]

<h2>

Of Smart and Dumb **Production**

</h2>
 We could be on the precipice of a growing friction between specialized, high-tech production and unspecialized, traditional mass production. The latter is unlikely to disappear since some goods require no specialization, and some markets do not demand immediate delivery.
 The emerging dichotomy between "smart" and "dumb" production, however, has important economic implications. Past relocation of high-tech goods production moved technical know-how from the developed to the developing world. But this source of technology transfer becomes unavailable if such production returns to rich countries. Adidas, for example, may be less inclined to automate its factories in Cambodia if it is doing so at home.
 Automated machines could, of course, also produce basic products. But the process is costly and requires skilled personnel for supervision and maintenance. Production of such goods is consequently likely to remain labor-intensive and rooted in the developing world. Still, as automation becomes cheaper, developing countries may eventually replace antiquated technology with their own automated factories. But this would not stem a trend toward decreasing trade flows and eliminating the historic opportunities for economic development that the relocation of industrial production has provided.

<h2>

Easier Retail **Strategies**

</h2>
 Online retail platforms such as Amazon and Alibaba can have an important effect on trade. Currently, only a tiny fraction of companies participates in international trade. In 2014, 304,000 out of the roughly seven million firms in the US exported goods.[21] The ratio in other countries is similar.
 Few firms engage in international trade because it requires considerable effort to deal with authorities in export markets, to conform to regulations and to build a retail network, among other obstacles. The emergence of online retail platforms alleviates some of these hurdles and eliminates the need to hire local staff. Instead, creating an online account and trading through that platform is sufficient for conducting international business.

<h2>

The Future **of Trade in Goods**

</h2>
 The "re-industrialization" hypothesis holds that industrial production is returning to the developed world because most goods can be produced by auto-

Photo by Mike Kononov on Unsplash.

Icons by The Noun Project.

 The relative ease with which an online presence can be established is likely to lead to increased business-to-consumer trade via online platforms and, therefore, trade flows in general. This may well attract more firms to trade internationally, which will offer consumers expanded choices. The increased competition and transparency will also generate lower prices, further benefitting consumers.

<h2>

Do it **Yourself**
The Impact of 3D Printing

</h2>

 The most disruptive effect on international trade, however, could come from the widespread use of 3D printing. 3D printing, or additive manufacturing (AM), refers to processes used to create three-dimensional objects, layer by layer, from a digital model such as an Additive Manufacturing File (AMF) or a Computer-Aided Design (CAD). This process was developed in the 1980s and has evolved rapidly in the last decade. 3D printers can now work with multiple materials including plastic, concrete and even metal.

3D printing
is gaining momentum

In 2008 there were 350 models of 3D printers.

Today there are more than

23,000

Source: Metropolitan Corporate Counsel.

 The versatility of this technology goes beyond producing rich geometrical and intricate pieces. It's also flexible enough to use everywhere you can imagine: your home, a refugee camp, an oil rig off the coast of Angola, a medical center in the Amazon rainforest, the International Space Station, anywhere!
 Essential items, whether for repairing a pacemaker or a tea cup, can now be printed on site within hours, potentially saving days or weeks of lengthy procurement processes.

Icon by The Noun Project.

In 2014,
US sales of industrial-grade 3D printers reached

a third

of the volume of total
`industrial automation and robotic sales.`

By 2020
that figure will rise to

42 percent.

Source: Metropolitan Corporate Counsel.

 From replicated organs to gourmet food, doctors, chefs, and anyone in between will be able to make it at home with an appropriate 3D printer and materials.
 It is already possible to produce equipment with moving parts; in ten years we may be able to print a smartphone.
 We are still years away from printing our own flat-screen TVs. Due to the economics of scale, 3D printers will remain less cost-efficient than automated mass production for the foreseeable future.
 That is not to say there is no short-term utility for 3D printing. The technology will play a huge role in producing goods in smaller numbers or goods requiring a high degree of customization.
 But despite all the potential benefits, there could be a downside. 3D printing may have a negative effect on the volume of trade flows if consumers engage in home manufacturing. How large the impact on trade may be and when it will materialize, however, remain unknown.
 To maintain exports, countries will need to substitute any decreased trade in goods with increased trade in data.

<h2>

The Future of **Trade in Services**

</h2>

 Many services are globalization-proof simply because the location where they are provided is fixed, limiting arbitrage opportunities. A haircut in Kingston, Jamaica is likely cheaper than one in Manhattan, yet few New Yorkers are flying to the Caribbean to get natty.
 We also wouldn't trust a 3D printer with the clippers. But digitization has allowed some services to be performed far from where they are commissioned or consumed. More than a decade ago, US- and UK-based financial firms began outsourcing accounting activities to Indian subcontractors. The success of Indian call centers was further proof that business services can be globalized due to improved communications and information-sharing via the internet.
 So there are differences between digitally tradable services, which include most business services, and non-digitally tradable services. Not much will change for the latter, unless these services lend themselves to automation (again, our robo-barber).

 But digitally tradable services, such as accounting, research and development, and legal services, will see increasing competition as they can be outsourced to low-cost countries. This can be an important source of economic growth for developing and emerging economies, provided they have the requisite digital infrastructure and human capital.
 Even here, though, there are exceptions. Regulations that prohibit outsourcing and automation prevent the globalization of some services, particularly in the legal arena. These services could be automated or outsourced, but political and social considerations offer protection.
 So, which way will digital services flow? It will most likely be from the developing to the developed world. White-collar workers in rich countries may have largely been spared the redundancies that hit blue-collar workers in the recent waves of globalization, but they may not be as lucky in the No Collar Economy. Despite gaining advantages from access to larger global markets, those in the service sector may learn the hard lesson that their counterparts in manufacturing have learned: High-quality products, whether goods or services, can be made and sold from many locations.

What? You didn't think the lawyers would take care of themselves?

<h2>
Bring **IT** on!
</h2>

 These trends are already appearing, and they will likely gain momentum in the next decade. What could trade look like in 2030?
 Here are a couple guesses:

 1.

 Developed Countries will Re-industrialize: Production of high-tech and highly customized goods will return to the developed world to facilitate faster delivery, but factories are likely to be almost completely automated.

 2.

 More Access to Bigger Markets: Through online trading platforms, more firms will be able to participate in international trade of manufactured goods and sell their products to a larger market. Consumers will have access to more products that are subject to greater price competition. And if you play your cards right, a drone just might bring you a burrito.

 3.

 You Just Got Served: Trade in services, especially business services, will become more global and more competitive. Relaxing non-tariff barriers to services will emerge as an important theme in international trade negotiations. Rich and developing economies can use services trade to compensate for the losses in high-tech production, provided they have sufficiently well-developed human capital and a digital infrastructure.

 What does this mean for international trade flows? Trade in raw materials will likely increase while trade in manufactured goods will likely decline. Trade in services will also increase, as will emerging economies' share of this market. Of course, the amount of exchanged data will rise with trade in services. And if 3-D printing becomes a widely used production technology, all these trends will be amplified.

 On the bright side, losing the remote will no longer be a crisis. **You'll just have to print a new one at home.**
</html>

Chapter

Smart Cities

Cities are awesome.

As hubs of economic activity, they are responsible for more than 80 percent of the globe's US$78 trillion annual GDP.[1]

Put another way, with a geographic footprint of just over 0.2 percent of the world's surface, cities generate the equivalent of four times the entire output of the US economy.[2]

And from their population to their economic output to their very surface size, they're growing at an `exponential rate.`

In 2007, for the first time, more humans lived in cities than in rural areas.

Today, urban areas house about

3.8 billion

residents, totaling 54 percent of the world's population.[3]

By 2050, that number could increase by another 2.5 billion. Cities will need to provide up to 6.3 billion people with opportunities to live, work and play.

90 percent of the increase will come from internal migration in Africa and Asia - rural folks in the Niger Delta moving to Lagos, for example.

This migration will place unprecedented pressure on urban infrastructure, services, and housing, which is already strained in many of the world's cities.

To survive, let alone flourish, cities will need to manage resources with great efficiency. They will need to become smarter to do this.

A lot smarter.

Photo by Alex Knight on Unsplash.

Perhaps oddly, given the mobile nature of digital technology, cities have emerged as major hubs for people searching for economic opportunity in an increasingly interconnected global economy.

But the world deserves mixed marks to date for its ability to handle mass urbanization. Housing is one area in which cities have not performed well. Waves of newcomers to larger urban areas must often make do with informal accommodation, sometimes building their own makeshift dwellings. Such housing, in the aggregate, creates large informal communities such as the favelas that are perched over the beaches of Rio de Janeiro.

People living in informal housing often find work in the informal economy. They may also power their houses with illegal electricity and wash their dishes with water from informal water supplies. Their entire existence is off the books.

Meanwhile, the demand to live in cities has pushed the cost of living through the roof. This has created a situation in which people find themselves in urban areas that offer jobs but are affordable only for the rich. It's a recipe for proliferating inequality.

To address these challenges, innovative policy initiatives are needed at the municipal level.

Can the tools of the No Collar Economy help?

Inefficient trash collection is a major problem in Mozambique's capital city Maputo. The MOPA program attempts to address this problem using digital technology and crowd participation. When citizens see problems, they can text and even send photos to MOPA headquarters, where problem areas are monitored in real time. Next, the MOPA team hits the road to investigate the problem. The team reviews the situation, and attempts to plan a solution.

See? Life in the city doesn't have to stink.

Our increasing ability to leverage Big Data is helping us make sense of our cities. The most successful of them have municipal governments that work hand-in-hand with the private sector, academia and residents to apply new tools to solve old problems. Waze, for example, helps users deal with the curse of congestion by mapping traffic patterns from mobile-phone data, adapting open-source user platforms to reduce the stress of daily life in the city.

If applied correctly, these tools can help sprawling cities realize breakthroughs in organization and management. Nairobi's residents have managed to map out their obscure and informally run public-transport system. The local government in Maputo, Mozambique has used citizen-generated data to address waste-management problems.

The No Collar Economy levels access for all players by eroding traditional business and class hierarchies and top-down government service provision. But a local authority's ability to harness digitization depends on its flexibility and willingness to adapt to the emerging technology, collaborate with partners, and learn from pilot programs and experiments. While any initial infrastructural investment (physical, institutional or even digital) may seem onerous or expensive at first, the gains from integrating the digital economy into urban planning initiatives can actually be achieved quickly and cheaply once digital platforms are in place. The smartest of smart cities coordinate with all sectors of society (citizens, private sector, academia) to ensure that establishing a digital economy has ripple effects that are far greater than past urban initiatives.

Image by NASA/GSFC/METI/ERSDAC/JAROS and U.S./Japan ASTER Science Team.

A Tale of Two Smart Cities

 Smart technologies and solutions are rapidly emerging as responses to the litany of challenges facing cities. These technologies offer policymakers and citizens a new toolbox of problem-solving mechanisms to deal with demographic change, workforce development and transportation demands. A smart city uses interconnected information and communication technology networks to improve the lives of its residents, most often by delivering services more efficiently, and spurring innovation and competitiveness.[4]

 There are two approaches that cities use to smarten up.

1

 The first and, by far, more well-known approach focuses government and private-sector investment on infrastructure such as:

broadband,
smart streetlights,
smart water &
electricity meters,
traffic-light sensors,
e-governance portals,
and
smart trash cans.

 The Greek capital of Athens has long suffered from chronic deficiencies in waste collection. Bins often fill up before city workers can empty them, leaving residents to deposit their garbage next to the overflowing cans.[5] This is not just an eyesore. It leads to the proliferation of rats and hazards that have health- and sanitary-related consequences for residents.

 Enter physical infrastructure as a smart solution. Athens is making a significant push towards installing rubbish bins capable of collecting real-time data on the amount of trash throughout the city. This information would then be fed into a central operations center that determines the most efficient and cost-effective pick-up route for garbage collectors. Garbage trucks consequently spend less time roaming the streets, workers use their time more efficiently, residents actually have their rubbish picked up, and mayors can claim bragging rights when they run for re-election.

2

 The second major approach to smarten up a city uses data that already exists or can be accessed with minimal effort to empower residents. This can be as simple as capturing GPS data on location, activity and public sentiment from residents' mobile phones or social media, or analyzing open public data from government data repositories. This information, in addition to digital platforms that enable residents to co-create smart city solutions, helps policymakers decide how to adjust public services to meet citizen demands. Collecting and using data from informational networks to provide insights into residents' activities and demands is the source of real power for cities in a digital economy. Data is most effective when combined, analyzed and humanized to construct a more holistic image of the city as a living organism.

 The two approaches are co-dependent. In other words, the high cost and often lofty ambitions associated with solutions in smart cities can be successful only if citizens see that those solutions improve their lives.

 To enable the resident engagement necessary to make a city truly smart, urban centers must create pathways for those residents to co-create smart solutions. Seoul, Leipzig and Detroit are among the cities that increasingly leverage the power of their residents by partnering them with the private sector. This collaboration can then use reams of open data to design technological solutions to local problems. More than 150 Detroiters, for example, joined forces with Loveland Technology to combat urban blight by participating in "Motor City Mapping", an effort to crowdsource data on every municipal property. By digitizing such information, residents hoped to make informed decisions about zoning and planning, and open new channels of communication with city hall.[6] In other cities, such as Amsterdam, hackathons produce program code that can be applied to a host of urban challenges. Social media enables international replication of this strategy. In other words, the NextBus app built to provide passengers real-time bus tracking in the San Francisco Bay Area easily fits Washington, DC's Metro and public bus system.[7]

What Makes a City Smart?

Source: Own elaboration.

There's no easy answer, as there are no practical limits to how digital technology can improve urban life.

After investigating several approaches, and by mixing and matching the best of them, we have come up with a list of core functionalities that show promise of success and sorted them in three main categories:

- Social Service
- Utilities
- Transport[5]

and mapped each functionality according to its dependence on three domains of action:

1. Adoption
2. Infrastructure
3. Governance

Each domain is driven by a specific technology and a set of enablers that can be activated to unleash the full potential of "smart" functionality.

Adoption
Personal choices

Fifth Generation (5G) networks bring forth the potential of real-time everything to improve the quality of life for everybody, everywhere:

Best of class availability
Digital Identity
Cybersecurity
Affordability

Wearables
Telemedicine
Telework
Pedestrian
Public Lighting
Mass Transit
Shared Mobility
Security
Public Connectivity
FinTech
Education & Culture

Infrastructure
Investment action

Internet of things (IoT) offers the ultimate management and optimization tool while generating an enormous amount of crunchable data for the creation of value and opportunities of today's Crowdpitalism:

Grids
Roads
Parks
Networks

Sewage
Electricity
Traffic
Water
Freight
Garbage
Clean Energy
Environment

Smart Cities

The key is an integrated & symbiotic action on all these functionalities, since, as a whole, they make for a smarter city than the sum of their parts.

Governance
Political leadership

Big-Data Analysis and Artificial Intelligence (AI) lower the public-sector share of GDP and make the state more effective, frugal and efficient, while allowing for a more dynamic and less intrusive process of legislation and enforcement:

Regulatory Minimalism
Pro Investment
Digital First
Open Data

Icon by The Noun Project.

Cities worldwide have used data to make services more useful and efficient.

Here are some examples:

Source: Own elaboration.

Map by freevectormaps.com

1.

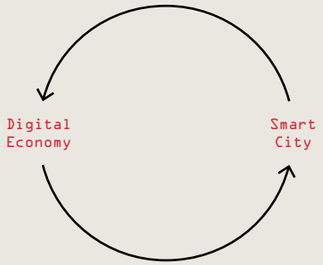
Inspired by baseball, Boston calculates a "city score" for complaints fielded by local-government departments by using live data from its non-emergency app and hotline, BOS:311. Stats on complaints registered and resolved are displayed on a dashboard so that the mayor can review them and take any necessary action, much as a baseball manager might analyze an ongoing game. The mayor can't go back in time and pull Pedro Martinez from Game 7 vs. the Yankees, but he can locate and repair 50 percent more damaged sidewalks, as he did in 2014.[9]

2.

Seoul's "Government 3.0" framework pushes for increased city-wide connectivity, citizen engagement and data analysis to make local services more efficient. Initiatives such as cheap broadband and public wi-fi hotspots ensure blazing fast internet access to 98 percent of the population.[10] Meanwhile, cashless payments through TMoney (a rechargeable smart payment card) and Upass (a transportation service) enable transparency in South Korea's push towards a cashless economy. Smart water and electricity meters are also monitored to make paying utility bills easier.

3.

In Amsterdam, the "het nieuwe werken" (new way of working) concept uses smart tools to generate flexible working hours and happier, more productive employees. The Deloitte building, designed around this concept, has 1,000 desks for 2,500 employees, with digital sign-ins to help teammates find each other. The workspace features open, light-filled central spaces with games and smart coffee machines to encourage interaction and collaboration. Sections of the building can be closed off on days when fewer employees are expected, saving electricity, heating or cooling, and cleaning resources.[11]



Government

- Provides services
- Creates the environment for innovation
- Sets and enforces regulations in an ever-changing environment

Private Sector

- Collects user information
- Develops innovative and efficient solutions
- Helps roll out innovations

Citizens

- Provide information on needs and preference
- Act as in-vivo testing ground for innovations
- Use range of skills to directly participate in innovation and development process
- Create a market for private-sector advancements

Academia

- Study trends
- Identify gaps
- Carry out training

It's a **Family Affair**

Local Synergies Make Smarter Cities

Amsterdam, Netherlands,

for example, shows the promise of such synergies since it fosters the environment and offers incentives for smart initiatives. The city held a competition in 2012 for a sustainable and innovative re-use concept for the derelict De Ceuvel shipyard. The winning group of architects designed a circular office park featuring energy and waste self-sufficiency. The site even uses soil-cleaning plants to restore the earth. Amsterdam also leases state-owned land free of charge to private-sector partners at its "Park 2020", which is built entirely on cradle-to-cradle principles. That means any component of the park's infrastructure, including construction material, can be re-used.

Local government is not alone in making cities smart. Private-sector innovations such as Google Maps and crowdsourced citizen-led initiatives such as OpenStreetMap, GoFundMe and Paytm also help. But government involvement can be crucial to disseminating new platforms to a wider audience, thereby making the platforms more effective.

Smart cities work best when citizens (who use services), private-sector innovators (who collect data and build solutions) and academics (who identify gaps and carry out training) collaborate with city government.[12]

Building Smart Cities in the **Developing World**

"Going smart" sounds sexy no matter where in the world you are. But gaps in wealth and infrastructure exist in every city, complicating any effort to even begin implementing smart strategies. While 3.5 billion people, or 47 percent of the world's population, have access to the internet, 3.9 billion (53 percent) do not. For every ten mobile phones active worldwide, fewer than five are connected to the internet.[13] Lack of digital access stymies smart solutions. In fact, such solutions are useless if people remain offline.

The challenges arise in countries with low internet penetration, and they are often in the global south. Unfortunately, it is also this region as a whole that is experiencing increased urbanization and population growth, which will accelerate demand for energy, food and water. But how can cities in the global south develop smart solutions when pockets of the population lack even basic connectivity?

This chicken-and-egg problem presents significant challenges but also exciting opportunities. For example, in...

Dar es Salaam, Tanzania

70 percent of the population lives in heavily populated, informal housing settlements.[14] More will undoubtedly join them in the world's ninth fastest-growing city.[15] Such crowded neighborhoods are already plagued by deadly and destructive floods that hit twice annually. To combat this, the city council teamed up in 2013 with the World Bank, the Red Cross, and the Open Geospatial Consortium to build roads, streams and flood plains in densely populated areas. The partners used the OpenStreetMap (OSM) app, a collaborative mapping program, to determine where such construction was needed. More recently, drones have been used to identify problem areas.[16]

Yinchuan, China

The IT company ZTE and the Chinese government have collaborated to build urban districts from scratch and outfit them with the latest smart-cities technology. This has included "smart mailboxes" that can change temperature if, for example, the tenant receives a delivery of cold food from the grocery delivery app. In addition, solar-powered trash cans compact contents and send signals to collectors when they are full. Monitoring technology (sensors, drones, cameras) continuously gathers data on everything from waste disposal to traffic, providing feedback that can help authorities increase efficiency of services.[17]

Some countries are developing smart strategies nationwide. Indian Prime Minister Narendra Modi has pioneered since 2014 a Smart Cities Mission that deploys smart technologies to nearly 100 cities in his country. These municipalities compete for federal and state funding under the Smart Cities Challenge, which is administered by the Indian government and Bloomberg Philanthropies. The goal is to prod Indian cities to meet priorities familiar to the

Maps by Rob, Martin23230 and Ssolbergj on Wikimedia Commons.

developing world, such as those related to sanitation, water, electricity and transportation infrastructure, all while implementing digital platforms.

Bhubaneswar, India

 Is home to some of the most ambitious Smart Cities Mission projects. The city of one million crammed into 42 square miles – that's like 115 percent of San Francisco's population with only 90 percent of its area – suffers from overcrowding, traffic congestion and a lack of waste-processing facilities. It also has a large, slum-housed population on the hunt for steady employment. When the Bhubaneswar Smart City Plan is completed, residents will have an option to overcome the transport challenge. They'll be able to use a bike-sharing system based on London's Santander Cycles and ride to the Bhubaneswar Town Centre district on Amsterdam-inspired cycle tracks. There, they can increase their employability by taking a class at the "commerce, business, and education hub", or avail themselves of long-distance transportation. The city is even building low-cost housing outfitted with water, waste, and electricity systems in the Town Centre district. In addition to constructing physical infrastructure, Bhubaneswar is implementing an Intelligent City Operations and Management Centre to digitize municipal cash transactions such as those for parking, public transportation and utilities.

 Despite the top-down nature of the central government's Smart Cities Mission, programs in Bhubaneswar are powered by its residents, approximately one-third of whom have participated via opinion polls, planning inputs and idea-submission platforms in the design and construction of the Town Centre.

What can **city governments** do?

 As the folks in Boston might say, "Play Ball!" Cities need to actively engage with digital technology, creating open environments that promote innovation. They need to be living labs and idea incubators in which public-private partnerships and citizen input contribute to experimentation. Cities can promote diffusion, inclusion and competitiveness through public forums, contests, hackathons and sharing. They can encourage data transparency to enable open access and organize workshops to teach users how to best manage new hardware and software, thereby removing capacity-building barriers to innovation.

 It doesn't have to be expensive!

 If your city is like ours, it's probably broke. But making cities smarter doesn't have to break the bank. Maputo's waste-management system, which uses simple text message-based menus to gather data and encourage civic engagement, shows that smart-city interventions can be low-cost, low-tech and of big benefit.

 Innovations can also be easy to scale and share. A program that solves a specific problem in one city can be re-tooled for a problem in another. OpenStreetMap (OSM) was invented to map London but has since spread worldwide.[18] Hackathons or contests that use open data to build publicly available apps are simple and inexpensive to organize, and the prize is often fame rather than cash.

 These ideas represent just a few ways to encourage residents to become involved in their communities. Cities are increasingly realizing many more options are ripe for development and worth pursuing.

 They would be stupid not to.

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Map by Ssolbergj on Wikimedia Commons.

The
No Collar
Economy

Chapter 7

e-Mocracy

Governance in an Era of Change

In this era of exhilarating change,
it can almost seem a buzzkill to decelerate from the hyperspeed of innovation
to consider the more mundane pace of governance.

The tedious nature of **bureaucracy** feels like a relic of the past—
something that belongs in a museum to remind us of how we lived before life was on-demand.

With the US Congress polling at about 20 percent approval in 2017,[1]
many Americans would likely support the automation of the legislative process.

But the No Collar Economy is about far more
than reconfiguring how we crunch data or earn a living,
and we cannot ignore the role of policymakers.

If the very nature of value is changing, then so too is the

nature of power.

The No Collar Economy is a whole **new ballgame,**
and the new game requires **new rules;**

rules that ensure **data privacy,**
the **safety** of our online valuables,
access to the **new online world,**
labor rights in platform employment,
and protection from digital **pirates**
and rogue governments.

Don't believe everything you
read on the internet just
because there's a picture with
a quote next to it.

-Abraham Lincoln

Are our governments prepared to referee this **new game?**

Governments struggle to keep up with the digital revolution. In Washington, US Treasury digital detectives try to track No Collar criminals with outdated computers running Windows XP. European governments struggle with the economic and social disruption posed by online platforms such as Uber. Should platform employment be prohibited to protect existing jobs? Should they be regulated and taxed? Should digital markets run wild? Emerging-market governments seek to leapfrog development steps through digital tools even though many citizens lack consistent access to the latest requisite infrastructure. Authorities can't seem to master the revolutionary technological changes sweeping the globe.

Photo by Alexander Gardner on Wikimedia Commons

 Meanwhile, cynical players find ample opportunity to illicitly exploit the exponential technological growth that outpaces the development of democratic institutions. The success of a Russian-government-supported interest's hacking the private emails of leading figures in Hillary Clinton's 2016 US presidential campaign shows the extent of the vulnerability. Although these Clinton insiders represented the upper echelon of seasoned, American political operatives, their decades of experience did not adequately prepare them for even a simple digital ruse.
 The hackers "fished" Clinton's team by posing as Google employees emailing a request for passwords. Her advisors obliged, and soon highly sensitive documents were public fodder.
 Few elected officials truly understand the cutting edge of digital innovation. Until they do, they will be fished, punked, hacked and duped. Just months after the Clinton debacle, Russia appeared to be behind a new digital caper intended to sway French elections.[2]
 Part of the Kremlin plot involves the alleged placement of "fake news". The internet has proved to be a petri dish for these false or half-true stories that chip away at public faith in democratic institutions. Peddling of fake news has become remarkably profitable, as Breitbart News can attest. The website recorded more than two billion views in 2016, traffic that it monetizes by cramming its online presence with advertisements and paid links to male-enhancement drugs, medical panaceas, and "After This Man Poured Metal Inside An Ant Nest, What He Dug Up Was Magical."[3]
 Governments, especially democracies subject to popular will and demands for transparency, face daunting challenges in the digital age. If data is the coin of the realm in the No Collar Economy, governments must ensure its safekeeping. Their ability to handle these challenges has significant impact on the global economy.
 Billions of dollars moved in different directions owing to the surprise outcome of the 2016 US election. Across the Atlantic, how the European Union chooses to regulate digital start-ups will affect the region's embrace of the No Collar Economy. And a titillating fake story about Barack Obama's birth certificate can mean big bucks for the man who poured metal inside an ant nest.
 The challenges are great, but so are the opportunities. Governments may be slow on the uptake, but around the world they are developing tools to expand citizens' access to the digital economy.
 We consider in this chapter three case studies of such expanding access. First, we check in on India, the world's largest democracy. Led by Prime Minister Narendra Modi, the government in New Delhi has bet heavily on digital technology to help jump-start economic development. His top-down push to make India "cashless" could help root out the informality and corruption in the Indian economy.
 Second, we look at Cuba. On the surface, the island nation seems an odd choice for a chapter on e-Mocracy, as Cuba is neither a democracy nor a beacon of connectivity. In contrast to India, however, the country has had a bottom-up approach that has put citizens at the forefront of digital advancements. This appears to be opening a window to political dialogue.
 Finally, we move to the Baltics to review Estonia, which has capitalized on a small population, strong internet literacy and a deep level of trust between citizenry and government to create a highly efficient e-identification system with major economic benefits.

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India

A Top-Down Embrace of the No Collar Economy

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 “India grows at night.” The argument, popularized by writer Gurcharan Das, holds that true expansion in the country’s economy occurs while the bureaucrats in New Delhi sleep.

 In the decades following India’s 1947 independence, the country’s economy was beholden to the “license raj”, a byzantine system of rules and regulations that made operating a private business a punishing bureaucratic exercise.

 The system also deeply embedded corruption. As economist Jagdish Bhagwati told us, often the only way a fork manufacturer could get the permit to make a spoon was to fork over some rupees as a bribe to government officials. In this stifling environment, India’s economy could only catch the tail end of explosive emerging-market growth in the second half of the 20th-century.

 But an interesting trend emerged in the 1990s as new technologies seeped into the subcontinent. Entrepreneurs found a refreshing degree of operational freedom in the digital realm. The government at first did not understand the technological transition, so it could hardly regulate it. And while the bureaucrats slept, India’s No Collar Economy took root. The country’s digital rise may not have been intuitive—India is a decidedly labor-intensive country developing a specialization in a capital-intensive sector—but it has been effective, helping it average more than seven-percent growth annually over the last ten years[4], right through the thick of the global economic recession.

 Critically, as digital India expanded, the government moved away from the overregulation of the license raj. In conjunction with broader reforms to cut red tape—efforts which began in earnest in 1991—New Delhi chose to *embrace* digital technology by viewing it as a tool to modernize its workforce, to boost economic programs in the outer reaches of a deeply underdeveloped country, and to help rein in economic corruption.

 In a nation in which more than 30 percent of the rural population is considered illiterate and hundreds of millions lack an internet connection, the government bet heavily on the value of digital technology.

 New Delhi would not be asleep for this ride. It would be steering the bus.

<h1>

Aadhaar
A Digital Identity

</h1>

 Implementing any new program with a nationwide impact on 1.3 billion people represents a monumental undertaking. "Government schemes" try to provide basic food access, employment opportunity and education for all citizens. But who is eligible for what? And how can the government plug the many cash leakages that spring up as it attempts to disperse benefits from Mumbai's overcrowded slums to the red-earth villages along the Kabini river?

India's biometric identification system can give a face to the faceless.

 New Delhi was spending billions of dollars on government schemes, but much of it was not reaching the intended beneficiaries.[5] In the mid-2000s, the Indian government believed it had pinpointed one key source of the problem: As much as half of India's population lacked a "root document"—a birth certificate that provided proof of identity.[6]
 The government launched an effort with a simple goal but an extremely complicated path to success. It aimed to create a biometric digital database of its immense population. The project-team began assigning a 12-digit number to each Indian, "backed by biometrics including fingerprint and iris scans stored in a central database."[7]
 Once established, the database—known as Aadhaar, or "foundation" in Hindi—would afford all Indians the ability to prove their identity, a requirement for participating in the formal economy, whether gaining employment or receiving a bank loan. The system also allowed the government to disburse benefits directly into a bank account or a mobile wallet affiliated with a given identification number. Such disbursements could then be made instantaneously and directly, cutting out months of bureaucratic hurdles, and ensuring that middlemen don't take a cut in the process.
 The sheer logistical difficulty of collecting the data and implementing the program was no mean feat. But so far Indians have responded positively to the effort. As of early 2017, more than 99 percent of Indians over 18—some one billion people—have enrolled in the digital-identification program.[8]
 Aadhaar is by no means a perfect system. The government has tied the public distribution of basic food stuffs to Aadhaar accounts, which can pose problems in rural India. Citizens in those regions may have an Aadhaar account, but poor internet connectivity may prevent them from confirming their identity or eligibility for government-distributed rations. This has led to infamous situations and viral photos of rural woman climbing trees in a desperate search for an internet connection so that they can receive rice.[9]
 These are challenges the Indian government must address. Still, Aadhaar's creation paves the way for even the poorest Indian citizens to join the No Collar Economy.

<h1>

Demonetization
Going Cashless in the No Collar Economy

</h1>

 An informal economy is defined as "activities and incomes that are partially or fully outside of government regulation, taxation and observation."[10] India's has reached staggering proportions, with some estimating that 75 percent of rural employment and 69 percent of urban employment is off the books.[11]
 The informally employed lack access to capital and training, and they do not receive health or pension benefits. Workers are heavily exposed to the winds of economic change. On a macro level, tax revenue suffers, which hampers funding of much-needed development and infrastructure programs. The informal economy also functions in cash, creating a fertile environment for corruption.
 Addressing such informality in a country as big as India is no easy task. In 2013, *The Economist* estimated that "[a]t the present rate, it will take half a century before India's economy is fully formal."[12] But Prime Minister Modi did not feel like waiting 50 years. He saw an immediate opportunity to use digital technology to put more of India's economy on the books.
 On November 8, 2016, Modi made a stunning announcement. Effective midnight the next day, he proclaimed, India's 500- and 1000-rupee bills—banknotes that together accounted for 86 percent of all Indian rupees in circulation—would no longer be legal tender.
 Indians and the international press referred to the policy as "demonetization," which was something of a misnomer as the retired banknotes were (eventually) replaced and redesigned with notes of 500- and 2000-Rupees. But the new notes were unavailable in the immediate aftermath of the announcement.
 In this cashless environment, however, Indians began to move toward online payment mechanisms. Businesses began to use digital services to pay employees. And Indians who had previously never banked online had to use such services to access their money. More e-banking and e-paying means more paper trails and more tax revenue. In the meantime, the world continues to monitor the effort to make the No Collar Economy cashless.

India is a cash-based economy but that may be changing.

<h2>

Can India **Keep Pace?**

</h2>

 Few emerging-market governments have pushed to adapt a No Collar Economy to the extent that New Delhi has in India.

 In fact, India's digital transition may be happening *too fast*. If Aadhaar requires internet, and if many regions remain without online access, the program could be counterproductive in the short term. Similarly, demonetization may be a fine idea, but its hasty implementation created real complications in an economy used to dealing in cash.

 India's leadership nevertheless appears convinced that the No Collar Economy is an unstoppable wave. The government is hoping its aggressive push will put India in a position to ride that wave.

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India's leadership is convinced that the No Collar Economy is an unstoppable wave.

<html>
<title>

Cuba

A Citizen-led Approach

</title>

 Some may balk at considering Cuba for a chapter on e-Mocracy. After all, the Caribbean island cannot fairly be called a democracy. In addition, between strict limits on speech and a punishing US trade embargo, Cuba continues to be one of the world's least connected countries. Public wi-fi did not exist until recently, and a household broadband connection remains a far-fetched dream.[13]

 But dual transitions are under way. Cuba is slowly opening its economy, and a new crop of younger political leaders, potentially more open to democratic norms, waits in the wings. A third transition, the rise of digital access, is also in an incipient stage. But it has arguably the most momentum and could significantly accelerate the first two transitions.

 In contrast to India, where the government is making a concerted, top-down effort to build the infrastructure for the No Collar Economy, Cuba's digital transition has largely been bottom-up. The citizenry's curiosity and ingenuity have pushed Havana toward permitting greater online access. And as Cubans connect, they increasingly find economic opportunities and venues to share political dialogue, the latter of which is still difficult to do in person. The connectivity also provides more exposure to international pop culture and markets, which Cubans find appealing. This, in turn, increases pressure for political normalization.

 The old guard's success in containing reform momentum owed much to personal allegiance and veneration. Their successors will not stand a chance against Beyoncé.

<h1>

The Cuban **Hacker Spirit**

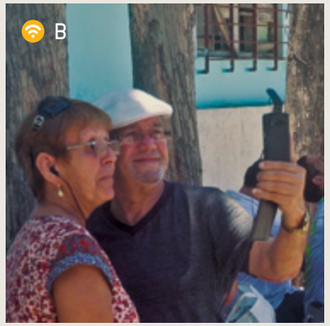
</h1>

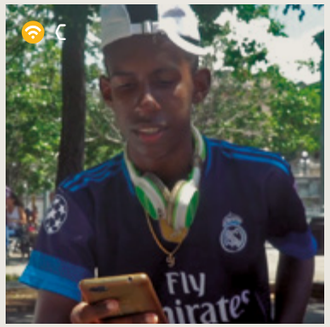
 The US has enforced since 1962 a trade embargo on Cuba that not only prevents many American entities from trading with the island, but also bars American trade with *non-US entities* that engage in commercial relations with Cuba. In this environment, scarcity in Cuba became a way of life.

 Havana's "old timers", the 1950s and 60s automobiles that still cruise the Malecon, have become a tourist attraction, but their existence attests to the Cuban response to the trade embargo. Few new cars have been imported, so come *hielo* or high water, the old ones must keep running.

 This Cuban spirit is playing a critical role in the island's digital transformation. Many Cubans were vaguely aware of the internet in the first decade of the 21st-century, but few could access it. Universities were the first and only access points for many millennials. Unable to connect beyond discrete locations at specific times, Cubans began to "reverse engineer" the internet. They recreated online functions in an offline setting.

 Take the story of Luilver Garcés Briñas. Frustrated by his inability to access Gmail outside his university, he built a program that converted emails to text messages, which are widely available in Cuba. Once





he began receiving his emails by text, his buddies quickly wanted in. But not everyone had Gmail, and Luilver tinkered with the code so it could also text Yahoo! emails. He then went further, writing new code that could send updates of almost any kind to Cuban mobile phones. BBC political news, Yankees scores, celebrity gossip—all this and more could be scanned from the internet and texted.
 A market for such services rapidly emerged. As the Cuban government began to permit private endeavors, in 2013 Luilver opened his own business named *Knales* (a play on the Spanish word for channels). The platform allowed customers to sign up for the updates they wanted.
 But how to pay for the services? After all, Cuba has no credit-card or e-commerce infrastructure. To overcome this challenge, *Knales* helped pioneer digital trade in cell-phone minutes. Mobile phone access in Cuba is paid for by the minute at a standard price, allowing the minutes to become proxies for pesos, a fungible commodity that can be traded electronically. By exploiting this, *Knales* became a nationwide provider of information and demonstrated the Cuban hacker sprit by reverse engineering online banking—in cell-phone minutes rather than hard currency.[14]
 Luilver was not alone in his endeavors. Starting as far back as 2001 other young Cubans began working to create an island-wide *intranet* now called SNET. They could not connect with the outside world, but they could link computers at home. A network originally of only a few computers in Havana expanded to include municipalities throughout the country. Users built knock-off versions of many globally popular programs such as Facebook, chat rooms and online gaming, which would at least connect Cuban communities.
 Then came *El Paquete, "*The Package". Lacking cable TV, Netflix, HBO and YouTube, Cubans have been cut off from the wild wonders of modern flat-screen entertainment, from cat videos to Sean Spicer to "Keeping up with the Kardashians".
 Enter the Cuban hacker spirit to fill the void. *El Paquete* "dealers" offer a huge inventory of up-to-date digital content, from the latest episodes of Game of Thrones to yesterday's Real Madrid-FC Barcelona football match. All are available for upload on hard drives.
 Cubans may not be able to stream content, but they can usually procure a flash drive. With this drive, they visit the *Paquete* distributor and download a tailor-made packet of digital content as current as anything airing in the US. In essence, Cubans engineered access to digital entertainment without connecting to the internet.

<h1>
Cuba
Online
</h1>

 As Cubans continued to jigger access to internet content, Havana's intransigence to connectivity became untenable. In 2015, as then-US President Obama spearheaded a policy of rapprochement, the Cuban government began opening "wi-fi parks" throughout the island. These public parks offer wi-fi connections that can be purchased by the minute (just as with cell-phone usage).
 Using smart devices—not ubiquitous in Cuba, but not uncommon either—people can now connect to the worldwide web. The prices remain steep: An hour of internet time costs US$1.50 in a country in which many people officially earn between US$20 and US$30 a month. But that cost is dropping. In 2015 an hour online cost roughly US$5. Still, the sub-par connectivity means an hour can be chewed up just trying to upload a photo or two to Facebook.[15]
 For many Cubans, the government's wi-fi parks represent an introduction to the No Collar Economy that has spawned online entrepreneurship. From restaurant-review apps such as *AlaMesa* to *Revolico*, the Cuban Craigslist, Cubans prepare content offline and then visit a wi-fi spot to upload it.

 They are participating in the 21st-century digital economy. **No collar is required.**

Image by Google Earth.

resources to enrich themselves?" asks another.[16]
 A semblance of a virtuous cycle may be emerging. Cubans' bottom-up ingenuity and curiosity have forced the government to relax digital restrictions. The increased access is being used to demand more transparency and even more connectivity. In the end, however, economic pressures may force the government to acquiesce to such demands.
 Cuba's post-revolutionary economy has been consistently propped up by a series of "sugar daddies". But Soviet support collapsed with the Berlin Wall, and Venezuela, Cuba's most recent benefactor, has literally run out of sugar.[17] Digital commerce could create valuable employment opportunities for Cubans and a vital revenue stream for the government (via taxable income and the direct sale of internet minutes).
 A more connected Cuba will almost certainly lead to a more democratic Cuba—as long as the US does not again restrict US corporate activity. If it does, American firms such as Sprint and Google may need to discontinue projects to improve the island's connectivity. And Cuban hardliners would have an excuse to re-consolidate power. Curiously, US President Donald Trump has indicated that he will pursue precisely this counter-productive strategy.

<h1>
Getting **Political**
</h1>

 The wi-fi parks have also helped a cottage industry of political bloggers. Sites such as Harold Cardenas' *Joven Cuba* (Young Cuba) push a political debate that has been all but non-existent in recent decades. While couched in socialist terms, *Joven Cuba* prods the government to increase access and open new avenues of dialogue. "How much has Cuba lost due to political corruption and poor resource management?" questions one post on *Joven Cuba*. "Who impedes the press from reporting on those using public

<title>
Estonia
The economic impact of e-Mocracy done right
</title>

 Odds are that you are not reading this in Estonia. So, quick question: How long does it take you to file taxes, buy a car and vote?

 If you are in Estonia, the answer is less than 25 minutes—to do all three.[18]

 This efficiency is thanks to country's electronic identification system, with compulsory participation for every Estonian starting with a state-issued digital identity assigned at birth. The system is based on an ID card about the size of a chip-enabled driver's license that requires one, sometimes two, secure codes to use. Ninety-eight percent of Estonia's 1.32 million citizens have an e-identity.[19]

 Estonia is an excellent laboratory for digital governance programs. It's small and relatively rich,[20] with deep digital penetration. More than 95 percent of Estonians have accessed the internet, besting the 85 percent pan-European Union figure.[21]
 These factors created an environment in which the e-identity system could flourish, but a government that led the effort also helped. In 2001, Estonia developed Look@World, a public-private partnership designed to promote internet literacy among the adult population.[22] At the same time, the country's banks, some of which were part of the Look@World consortium, began pushing for a more reliable identification method and threw their support behind a digital-ID concept.[23]

According to a World Bank report,

"selling a car in Estonia can be done remotely in less than

15 minutes,

filing an online tax declaration takes an average person no more than

five minutes,

and participating in elections by internet voting takes

90 seconds

on average."

 These efforts resulted in the growth of digital democracy alongside an expansion of internet literacy. The e-identity's capabilities developed gradually, allowing Estonians time to adjust to the growing collection of authorized services and interactions available through the digital ID cards. The transparency, security, efficiency and convenience this system provides have helped cement a high level of social trust that empowers the government to continue to digitize services.[24]

<h1>

Identifying the **Economic Impact**

</h1>

 Besides voting online, Estonians can use their digital ID cards for a host of economic activities such as:

- Submitting job applications
- Signing contracts
- Conducting financial transactions
- Filing taxes
- Accessing healthcare
- Paying energy bills
- Buying public-transportation tickets
- Traveling within the EU

 The government and authorized private-sector entities, such as energy providers, telecom companies and banks that are allowed access to this personal data, share the information on a platform known as the X-Road.[25] This networked system ensures that digital-identity holders must provide personal information only once. They are not asked for it again once their data is in the system.

Photo by Markus Spiske on Unsplash.

 The X-Road platform and the personal data that flows through it are governed by a series of regulations that provide the legal basis for digitized transactions. By the time the state rolled out the digital ID system in 2002, this institutional infrastructure had already been established. [26]
 Just as India faces security concerns regarding its Aadhaar database, Estonia must also protect the wealth of information it holds on its citizens. The country maintains a constant effort to ensure the security of its digital ID system, working to identify threats and preempt security breaches. A card can be easily cancelled if it is lost or stolen.
 A double authentication process also complicates theft and fraud. Depending on the transaction, the ID-card holder must confirm one or two distinct PIN codes to authenticate and authorize. In addition to securing the identity behind multiple passcodes, the Estonian government is working to bring blockchain technology to all levels of X-Road digital infrastructure, ensuring transparency and preventing fraud through internal security processes.[27] Blockchain, best known as the distributed ledger technology that secures Bitcoin's value, allows data to be added to a system and shared but not altered.[28] Introducing blockchain technology would further secure transactions occurring through X-Road.
 Still, external threats remain a concern. In 2007, Russia-based IP addresses were the sources of a series of cyber-attacks on Estonian banks, newspapers and telecom networks.[29] Estonia responded by seeking to enhance its IT and cyber-security capabilities. The country continues, undeterred, with its e-identification program.[30]

<h1>

Successes of **e-Stonia**

</h1>

 Estonians' frequent use of their e-identities confirms their view that the system's benefits outweigh the security threats. Estonians use e-identities to file 95 percent of income-tax declarations, and one in every three citizens uses an e-identity to vote electronically.[31] The ease of interacting with the government through an e-identity has even strengthened civic participation. Voter turnout for local and national elections has increased since the introduction of e-voting in the mid-2000s.[32]
 Estonia's digital economy is also booming thanks to the system. The country's aggressive push into the global digital economy helped it rebound quickly following the financial crisis of 2008 and motor through the subsequent Eurozone malaise.[33]
 Via its e-Residency program, Estonia has also opened its No Collar Economy to international players. Digital ID cards have been issued to non-residents since 2014, and 20,000 people from more than 130 countries have since applied for e-Residency. [34] This status confers the ability to open a company based in Estonia and take advantage of a streamlined, transparent bureaucracy and a free, secure internet. It takes only 18 minutes to register a business with an Estonian e-identity.[35] The program is already making the small Baltic country a convenient hub for new companies. Just three years after the e-Residency program's inception, Estonia boasts the third highest number of start-ups per capita in Europe.[36]
 Just as Facebook, Amazon and Google augment their worth by drawing in more users, Estonia is working to spread its model to other countries. In addition to targeting individuals with its e-Residency program, Estonia wants to overhaul the EU data market and establish a free flow of data throughout the bloc. An "e-Europe",[37] the country argues, would raise GDP, facilitate travel and business, and streamline healthcare.[38]

</html>

From the biggest **BRICS**

to the smallest pieces

of the old **Soviet bloc,**

governments are scrambling

to keep apace of the digital revolution.

For those that can hack it,

e-mocracy offers tangible benefits:

weeding out corruption,

streamlining services,

increasing efficiency,

shredding red tape.

Meanwhile, governments that fall behind the
constantly-evolving digital economy may find themselves

disconnected from their citizens

and the greater global economy.

Chapter

The End of Geography

A Call to Action

This **book** is about sharing our interpretation
of the challenges that exponential change presents to the global economy:

our jobs,
our bank accounts,
our politics,
our cities.

And this is just the beginning: We don't even discuss health, education, and many other important areas.

We have aimed to turn that interpretation
into useful concepts and stories, which,

combined with statistical bites
and the occasional pop-culture reference,

are meant to focus on your development,
raising your awareness about making the most of the opportunities
and meeting the challenges of the No Collar Economy.

Photo by Slava Bowman on Unsplash.

By now you should be asking yourself a most consequential question:

WTF?!

What's. The. Future?!

We don't pretend to have the answer.
As the Danish say, "It's difficult to make predictions, especially about the future."
However, we do have a call to action.
It is not meant to be a definitive guide to navigate the digital age.

Instead, we offer some

common-sense,
digitally-adapted,
action-based
principles

to kick-start - in case you haven't already -
your digital transformation and embrace the opportunities

of a brave new world with no collars,
borders or natural barriers.

Involve the youngsters

Take them seriously. They are digital natives.
Few know the landscape better
even if their judgement is occasionally flawed.

Incorporate the veterans

Yes, the up-and-comers may be on the cutting edge of technology,
but they have much to learn about developing a life, a business or a country.
Not all value in the No Collar Economy is measured in lines of code per minute.

All Aboard

We are not living
in an age of change;
we are experiencing a change of age.

Most political,
social and
industry leaders

pay lip service to the
digital jargon,

but they fail to recognize
that **the future is not an extension of the recent past** and that **the old playbook does not guarantee future victories.**

 The specifics are unique, but the dynamic is not. When electricity replaced steam as the main source of factory power, few managers took advantage of the opportunities of the radical new technology.
 Factories were often transformed only when old directors were replaced by a younger generation.
 This transformation sometimes occurred decades after electricity was introduced on the factory floor.

Photo by Anna Dziubinska on Unsplash.

Photo by h heyerlein on Unsplash.

Be mindful

Search. Filter. Discover.
Track. Question. Mix.
Interact. Give back. Repeat.

The wealth of digital information available is only as valuable as the consciousness with which you use it.

Stay Human

As the code governing our digital world challenges our tried-and-true methods of economic, political and social interaction, it is natural that we feel hostage to the perils of

hackers
automation
digital fads
electronic surveillance
cyberterrorism
technological collapse
“alternative facts”

 In this chaotic period, the allure and paranoia of digital connection will be potent. Technology can be a valuable tool for real human interaction as evidenced by online dating platforms (tell your folks you met at the supermarket). But it can also act as an opiate, an avenue for escapism that leads to detachment.

 The No Collar Economy can be the No Color Economy, breaking barriers of geography, class and race. After all, who knows the ethnicity of the developer of that app that lets you beat rush-hour traffic? But it can also be an echo chamber of ignorance, a veil of anonymity for deplorable views.

 If we are not careful, the economic transformation could leave many behind, disenchanted, and ever more susceptible to online extremist outlets.

Let it flow

And stay engaged.

To keep up with an ever-changing No Collar Economy,
you must become an active part of a smarter environment
that benefits a world larger than yourself
and that is beyond your control.
You'll improve your life and stay relevant if you do.

Control Freaks Need **Not Apply**

Everything is
getting smarter.
From our production
plants to our
refrigerators to
our trashcans.

The powerful combination of
the Internet of Things,
Big-Data analysis,
artificial intelligence
and 5G networks

 is accelerating the speed at which interactions happen among people, products and machines, in all their possible combinations. This is challenging and fundamentally changing how value creation occurs.
 But here's the catch: To make the most of it, we must be willing to dive into digital and deal with much more uncertainty than most of us like.
 The development of a smart environment is equal parts engineering and art. And they are not necessarily balanced. Nor are they ever predictable.

What works in Silicon
Valley may not work in
Rio de Janeiro.

Photo by Ravi Pinisetti on Unsplash.

Image by Urfan Hasanov on Unsplash.

Stop and look around

The business environment is always changing.

Now, though, it is changing much faster
than we are used to, so try to keep up.
When in doubt, check out what the Luddites are up to…
then do the opposite.

If you are not disrupting your business, **someone else will.**

This is the age of the service industry.
And as the Internet of Everything expands from the richest cities to the poorest rural outposts, no talent or resource will be too small to monetize.

If you have a good idea, **run with it.**

Because someone else is already working to make it

Better, Smaller, Faster, Cheaper.

 Competition is fierce, but it spurs a rare opportunity to stop and ask ourselves: Why do we do things in a certain way? Is there a way we could do them better?
 Businesses traditionally underscore, in theory, the importance of taking risks, but how many balk when push comes to shove?
 In the No Collar Economy, business as usual is not a viable strategy.

Sharing (mindfully) is all you need

As William Gibson says, the future is already here.
It is just unevenly distributed.

If you are among the lucky ones making the No Collar Economy roll,
make sure to keep it accessible to newcomers
and to give back to those left behind.

Sharing is Caring

As repeated throughout
this book,
ubiquitous interconnectedness
is a game changer.

Your work? Changed!
What you buy? Changed!
How you meet people? Changed!
Whom you associate with? Changed!
National security? Changed!
Political participation? Changed!
Skills and education? Changed!
----------: Changed!
(insert noun)

 Machines are getting better at being machines. They are taking our jobs, facilitating our financial transactions, coordinating super complex long-distance logistics and anticipating our every material need.
 People need to become better, much better, at being people.
 We can fear automation and resist it. Or we can embrace the freedom unleashed by artificially intelligent e-serfs.
 Your soft skills hold the key to open infinite possibilities.

Share them!

Photo by Jamie Taylor on Unsplash.

Overall,
keep learning, keep learning, keep learning.

Don't be too proud to learn to learn again.

And like the Little Prince:

Always look beyond
the hat-like shape
of a digital challenge

and picture
the elephant-sized opportunities
that lie ahead.

This is not the end.
It's only the beginning.

Do your bit

Photo by Efe Kurnaz on Unsplash.

Notes

All the links were checked & valiated for the last time on October 9 2017.

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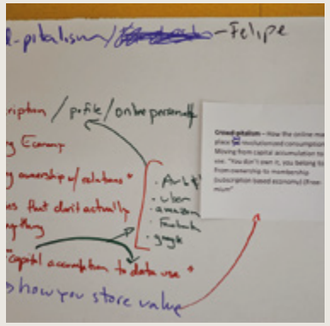

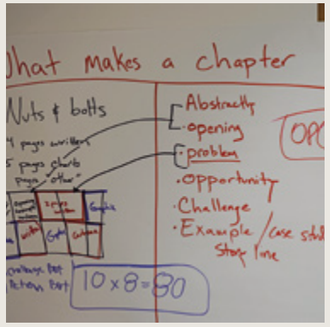

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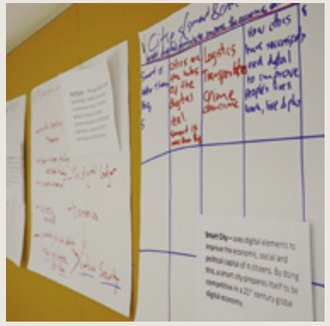

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Thanks for reading

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Our world is constantly changing—a simple truism that is not unique for any given generation or era. And yet the very fact that our dynamics shift continues to surprise us.