

A Declaration of Interdependence

Towards a New Social Contract for the Digital Economy

By Don Tapscott

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Executive Summary

Brexit, then Donald Trump were a one-two punch, smacking the world in the face. People everywhere are “mad as hell and they aren’t going to take it anymore.” As such they have become vulnerable to populism, xenophobia, and scapegoating minority ethnic groups, races and religions for problems. Centrist parties are in rapid decline and extremist right wing parties from Hungary and Poland to France and Germany are on the rise. In other countries, particularly in southern Europe where memories of dictatorship and fascism are still raw, the left is ascendant. Perhaps as unthinkable as the success of Donald Trump, is Bernie Sanders, an avowed Socialist who almost won the democratic presidential nomination, and many think he could have beaten Trump in the election. The unfolding story is one of growing discontent with the deepening economic crisis and the old establishment that created it.

The world has seen this story before, in the lead up to the second world war, but the analogy is imperfect. Among other things the rate of change is different. As the digital revolution unfolds it is driving profound changes in the global economy, labor markets, old institutions and society as a whole. It is enabling spectacular innovation and unprecedented wealth creation. At the same time growing social inequality, the decline of the middle class, pernicious unemployment and underemployment are fueling unrest. Networks enable outsourcing, offshoring and the globalization of labor markets. Government architectures and policies have not evolved and there is a fiscal crisis and threat to the industrial age social safety net everywhere. Data, a new asset class has been captured by powerful forces and one result is the continual erosion of personal privacy and prosperity as a small handful of companies capture the largess of the digital age asymmetrically. Climate change is threatening our biosphere with huge displacement and other disruptions just beginning to be felt.

Now with the Fourth Industrial Revolution¹, centered on – machine learning, robotics, the Internet of things and blockchain plus biotechnology – many core functions of knowledge work are threatened. Meanwhile industrial age institutions for solving global problems – based on the Bretton Woods model of global institutions, are stalled. The upshot is that the social contract – the agreements, laws and appropriate behaviors people, companies, civil society and their governments no longer serve us well.

The final chapter of our book *Blockchain Revolution* called for nothing less than a new social contract. This document is our Manifesto for the Digital Age. We argue that new multi-stakeholder approaches will be required where governments, the private sector, the civil society and individuals forge new understandings and new action plans. Call it a new Declaration of Interdependence.

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The spectacular innovations and opportunities of the digital age provide civilization with a new set of opportunities to leap forward, rather than decline and even collapse. In fact, it is now possible to conceive a new achievable set of rights.

Is it unthinkable to say that it is our right to access affordable digital infrastructures, have media literacy, have access to education at any level and to lifelong learning should we choose to be lifelong learners? Surely, we have the right to work, to change jobs, to create a business, to be able to monetize our own assets, to contribute productively to society and to have that contribution valued economically. We have the right to transparency and accountability on-line and in increasingly automated processes and to expect that future technological developments are guided by strong codes of ethics in the interests of all humanity.

We believe that the next era of the digital economy provides the wealth to ensure that everyone has a basic income that ensures they can sustain themselves and their families and that they can live a healthy life through universal access to healthcare. People have a right to security of the person, informational privacy and to own and protect their identities and monetize the data they generate. Humans today and future generations everywhere also have a right to clean air, safe water and to not lose their homelands or livelihood to changes in our climate. They have a right to live a life free of national, religious or tribal military conflict. New networked models of global problem solving should make such a dream possible.

The digital age also requires profound changes to our old industrial institutions, and infrastructures – including education, healthcare, labor unions, transportation systems, electrical power networks and above all governments. Networks enable citizens to participate fully in their own governance, and we can now move to a second era of democracy based on a culture of public deliberation, active citizenship, transparency and governments that are accountable to their citizenry, not big money. Mandatory voting encourages active, engaged and responsible citizens.

In the name of global competitiveness and short-term shareholder value, business has been left off the hook for far too long. It's time for business to step back up to the table as responsible and active participants in the new social contract in its own long-term interests and in the interests of a healthy society and healthy economy overall. Even – or especially – in a time of exploding information on line, we need scientists, researchers, and a professional fourth estate to search for the truth, examine options, and inform the public discourse.

Over-ambitious or even utopian you say? Perhaps not considering the alternative trajectory facing humanity. Our goal of course, is not to create a complete analysis and strategy for each of these but rather to peel off the first layer of the onion – to put a stake in the ground as a catalyst for further investigation, discussion, debate and action.

What is a Social Contract?

Although there are historical antecedents, the concept of a “social contract” is generally considered to have originated with Thomas Hobbes in the 1650’s following the English civil war. In contrast to the “natural order” of “war of all against all”, he posited that humans contract with each other in a political community or civil society to be ruled by a sovereign in exchange for security.² Later in 1688, John Locke rewrote the language of the social contract to include property, i.e. the protection of life, liberty, and private property in exchange for giving consent to be governed. It is this language which, as subsequently modified by Thomas Jefferson, eventually made its way into the United States’ Declaration of Independence as “life, liberty and the pursuit of happiness.”³ Jean-Jacques Rousseau in the 1760’s was another important contributor to the concept of a social contract and there have been many others. In short, “social contract theory, nearly as old as philosophy itself, is the view that persons’ moral and/or political obligations are dependent upon a contract or agreement among them to form the society in which they live.”⁴ Like any contract, it retains its legitimacy only as much as the various participants continue to fulfil their part of the contract. Over time, our modern democracies have evolved as a way of linking governance and power to societal wishes.

The industrial revolution created wildly disproportionate wealth for a new elite and at the same time brutal conditions for masses of workers. Nineteenth and early twentieth century reforms in Britain, the US and other parts of the world included (almost) universal suffrage, public education, a social safety net, income tax, anti-monopoly legislation, securities legislation, labor laws, and environmental protection measures amongst other elements.

In the 1930’s, following the Great Depression and with 25 per cent of the American workforce unemployed, President Franklin Delano Roosevelt was the author of the “New Deal” which invested heavily in public infrastructure, introduced a social safety net, including social security and unemployment insurance, and introduced new legislation across a range of fields including banking, agriculture, labor relations and home ownership. The relationship between the US Government and the people of the United States was fundamentally changed.

The US social contract changed again after World War II with legislation and programs designed to ensure, as Robert Freeman has written, that “everybody would share in the fruits of an expanding economy. That’s what Kennedy’s ‘rising tide lifting all boats’ metaphor was about. It worked, brilliantly.”⁵

At least it worked up until the 1980’s. Due to many factors – globalization, changed policies that began under Ronald Reagan (e.g. ‘supply side economics’), technological change, and weakened institutions amongst other factors – economic growth is no longer broadly shared and the gaps between rich and poor; haves and have nots is widening. As Freeman notes, “median income adjusted for inflation is lower today than it was in 1974. A staggering 40 percent of all Americans now make *less* than the 1968 minimum wage, adjusted for inflation. Median middle-class wealth is plummeting. It is now 36 percent below what it was in 2000.”⁶

It is not only in economic terms that progress has not only stopped, but reversed itself, at least in the United States. Ben Fountain writes in the Guardian:

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The New Deal goal of broadly shared prosperity has taken a beating the past 40 years, and the damage shows. By virtually every measure relative to other rich nations, the US has lost ground since the 1970s. We're shorter (height is an excellent indicator of social conditions), we don't live as long, more of our babies die before their first birthdays, wages and educational achievement have stagnated, and inequalities of wealth and opportunity are higher than at any time since the late 19th century. Mortality rates for middle-aged white Americans have actually risen the past 15 years, especially for non-college-educated whites. Maternal mortality rose 27% nationwide between 2000 and 2014. In Texas, the maternal mortality rate doubled between 2010 and 2014.⁷

While not as extreme as in the US, some of the same trends can be observed in other western democracies. Without a doubt this is a driving factor in the recent US election and the UK referendum on the European Union (Brexit): large proportions of the population in both countries feel they've been left out of the new economy – the old social contract has broken down without a new one to replace it; there's a widespread feeling that the new "rules", whatever they are, have been imposed without their consent.

This paper proposes a long overdue new social contract for the Digital Economy.⁸ We are in the midst of a global economic transformation at least as significant as the industrial revolution. Whereas the industrial era social contract was developed over decades, and in its broadest sense over centuries, today's changes are happening infinitely faster. More importantly, Moore's law indicates that the rate of change is accelerating exponentially. The upshot is that our regulatory and policy infrastructures are woefully inadequate and adapting too slowly or not at all to the requirements of the digital age. The disruptions of today are moving so quickly they are getting beyond the capacity of individuals and institutions to comprehend them let alone manage or even mitigate their impact. Our democratic institutions and instruments were designed for the industrial age – in fact they originated precisely in the transformation from agrarian feudal societies into industrial capitalist states. While technological change is only one driver of our current transformation, digital technologies both contribute to the disruption and can also play a significant role in the successful definition and implementation of a new social contract, one which better meets the needs of modern societies.

After 2016, many are feeling pessimistic – is the dream of a renewed social contract even possible? We answer Yes, and the time is now to take up that challenge. As recently summarized in *The Economist*:

2016 also represented a demand for change. Never forget liberals' capacity for reinvention. Do not underestimate the scope for people, including even a Trump administration and post-Brexit Britain, to think and innovate their way out of trouble. The task is to harness that restless urge, while defending the tolerance and open-mindedness that are the foundation stones of a decent, liberal world.⁹

Drivers of Change

The combination of technological change, globalization, demographic change and climate change is significantly altering the entire context within which we organize ourselves and causing pressure on the social contract that in the post World War II period worked reasonably well towards the betterment of all society. We will introduce these drivers in this section and address their implications in greater depth in the next section.

1. The Fourth Industrial Revolution

“The First Industrial Revolution used steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres”¹⁰ Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum labels this as a new “revolution” because of the exponential rate of change and its reach to virtually all industrial sectors which together will be transformative – and disruptive - across entire systems. McKinsey Group uses the phrase “combinatorial technology explosion” to describe the significant technological advances resulting from the combination of seemingly disparate inventions and disciplines. “Combinatorial effects are compounding the impact of Moore’s law, creating more scope to innovate and to conceive new businesses.”¹¹ Amongst the most noteworthy technological trends are significant advances in robotics, artificial technology, nanotechnology, blockchain and crypto currencies, quantum computing, and biotechnology. Combine these trends with billions of people and trillions of things connected together with unprecedented access to information, storage and processing power and we’ve barely begun to see the implications of this revolution.

The upshot is that technology is smashing our old social contract and understandings. It is now more than any other factor contributing to structural unemployment, social inequality and a bifurcation of power in many countries. It is at the heart of many failing institutions and contributing to a complete fragmentation of public discourse. It has led to the decimation of our privacy on the one hand and the declining security of the person on the other. And it is a driver for the destruction of our biosphere....and its salvation.

2. Globalization

The second big driver of change is globalization, including freer movement of capital, production, goods, services, and – to a significant, but lesser extent - people across national boundaries. Globalization, especially in the latter half of the last century, has been enabled by technological change and by international agreements and institutions and has resulted in many benefits at the macro and micro level. It has also caused significant disruption to and uneven impact upon local economies, virtually every sector, and individual workers. The resulting inequality gap is increasing pressure on governments and international institutions to prevent or mitigate the negative impacts of globalization on their constituencies.

3. Demographic Upheaval

The United States, Canada, Europe, Japan and China are dealing with population aging and all its implications including seniors' poverty, rising health costs and, in some cases, shortage of skilled labor. At the same time, other parts of Asia, Africa and the Middle East have very young populations and are facing significant youth unemployment. Poor economic conditions, climate change and/or war in some parts of the world are leading to large numbers of economic migrants and a growing number of refugees seeking opportunity and safe-haven. In some European countries, the United States and elsewhere concerns have been raised about their capability to absorb these migrants and refugees both economically and culturally.

4. Climate Change

Global warming brought about, in large measure, by human activity is contributing directly to climate change with huge implications just beginning to be experienced. Amongst the indicators of climate change are the frequency of extreme weather events and changing patterns of temperature and precipitation. These in turn have an effect on human habitation, crops and growing seasons with significant implications for human health and well-being. Severe drought in east Africa in spring 2017 is just one example which – along with war – is contributing to risk of starvation for millions of people. In the near future, we can expect over a billion people to lose their water supply, be flooded or otherwise be forced into upheaval, and migration, resulting in a new and massive refugee problem, regional conflict and turmoil in many parts of the world. Virtually any discussion on the above three drivers – fourth industrial revolution, globalization, demographic upheaval – and their implications, must necessarily include the environmental implications too, especially impact on global warming, to ensure we design solutions that preserve our world for future generations.

The Current Contract is Breaking: Nine Disruptions

Together the above drivers are resulting in fractures in our western societies. There is growing structural unemployment; inequality in income, power, wealth, education and opportunity; fragmentation of public discourse; severe pressure on governments and other institutions; and a growing crisis in democratic institutions. There are ongoing threats to privacy and security which challenge our autonomy as individuals. There are threats to our biosphere. Our current path is simply unsustainable.

To begin, three factors contribute to widening economic gaps: emerging structural unemployment, growing social inequality and increasing asymmetry of power between those who have it and those that don't.

1. Structural Unemployment

Digital technologies and other trends have broken the old social contract by contributing to structural unemployment and a growing number of part-time and other precarious workers including freelancers, temporary workers and short-term contractors working without the security and benefits that come with a full-time job. This is serious because so much of our individual and collective economic and social well-being has been tied to full-time employment. These trends, while already significant, are expected to accelerate with the growing ‘sharing’ economy and the rapid introduction of artificial intelligence and robotics.

Since the beginning of the digital economy, there has been a shift towards information-based and “knowledge worker” jobs in the United States, Canada and other countries. Digitization and automation have enabled increased productivity and the outsourcing of manufacturing and other work to people and organizations, often in other jurisdictions, to reduce costs and increase productivity. A study by the Center for Business and Economic Research at Ball State University found that 85% of manufacturing jobs lost in the US between the year 2000 and 2010 were due to technology, even as productivity and output increased.¹² “Automation has transformed the American factory, rendering millions of low-skilled jobs redundant. Fast-spreading technologies like robotics and 3D printing will exacerbate this trend,” notes Mireya Solís, a senior fellow at Brookings Institute.¹³ These changes haven’t been limited to blue-collar jobs, as many white-collar jobs have also been made redundant or moved to an outsourcing model. The earlier ‘job for life’ model is increasingly rare with technology-driven change requiring re-training and job changes on a more frequent basis.

There have been many positive employment benefits including many new jobs in the information and information technology sectors and numerous innovators and entrepreneurs developing new products and services – even entire industries - based on the new technologies.¹⁴ While many individuals enjoy the relative freedom of part-time, contract, or freelancing from anywhere at anytime to many clients and with many collaborators, they do not receive healthcare, insurance, vacation, sick days, pensions or other benefits of employment. They also do not have the long-term job security that encourages them to buy a home, start a family, or otherwise plan for and invest in their future. In just one decade, 2005 to 2015, researchers at Princeton University calculated that the incidence of alternative work arrangements in the US economy had increased from 10.7 percent to 15.8 percent.¹⁵ That’s a huge increase and accounts for much of the job growth during this period.

In the last several years, new business models have emerged, often referred to as “the sharing economy”, although there is no actual sharing in most cases. Companies such as Uber, Airbnb, Lyft, and VRBO amongst others have developed “market-matching”¹⁶ digital platforms to link buyers (e.g. travellers) to sellers (e.g. drivers and vehicles, vacation housing) and to allow them to complete a secure transaction (e.g. reservation and payment) amongst other functions. While this model has enabled many individuals to earn revenue from their under-utilized assets, it is also very disruptive to existing industries. It is taking place outside the traditional employer/employee relationship, leaving many workers and clients un-protected, taking clients away from traditional providers, and putting downward pressure on prices. Steven Hill estimated in 2015 that “within a decade, nearly half of the 145 million employed Americans are expected to be impacted.”¹⁷

These trends are only going to accelerate with the growing use of artificial intelligence and robotics. A 2017 McKinsey Global Institute research study¹⁸ calculates that 45 percent of **activities** could be

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automated by 2055 (plus or minus 20 years), with virtually every job, from CEO to clerk, containing some elements that could be automated. This is a remarkably similar number to an earlier study by Oxford researchers Carl Frey and Michael Osborne in 2013 who predicted, with high probability, the displacement of 47% of US employment over the next 10 to 20 years.¹⁹

While some have taken such calculations and predicted that up to 50 percent of jobs will be eliminated by automation in the near future, others are optimistic that just as the luddites of the 19th Century were proven wrong, new jobs and opportunities will emerge to replace those currently being lost.²⁰ The 2017 MGI study calculates that fewer than five per cent of jobs can be fully automated as they retain some elements requiring human intervention, including creativity or human emotion and sensing.

... the scale of shifts in the labor force over many decades that automation technologies can unleash is not without precedent. It is of a similar order of magnitude to the long-term technology-enabled shifts away from agriculture in developed countries' workforces in the 20th century. Those shifts did not result in long-term mass unemployment, because they were accompanied by the creation of new types of work. We cannot definitively say whether things will be different this time. But our analysis shows that humans will still be needed in the workforce: the total productivity gains we estimate will only come about if people work alongside machines.²¹

The challenge then is how will we respond to, and prepare for, these dramatic changes in two respects: maintaining and creating new opportunities for employment and adapting to new forms of 'employment' which no longer include the "safety net" previously considered an integral part of the social contract. Do we have the ingenuity to ensure that the opportunity for and benefits of technology-enabled renewed productivity growth are shared widely, including with displaced workers?

There is a tight linkage between employment and economic security. For that reason, some argue that we are incentivized to protect the concept of employment and its central role in our society at all costs whether or not it makes sense from a broad economic and social perspective (and vice versa). In the next section, we will look at that linkage and whether or not it needs to be loosened in the new economy.

2. Growing Inequality

Digital technologies have broken the old social contract by contributing to increasing economic inequality within and across societies. While the early view of the Internet, held by present company included, was that it would have an overall levelling effect by opening up access and opportunity to many previously left out of today's economy, that access has not translated into equal economic opportunity. When combined with the employment impacts discussed in the previous section, this has led to a significant and widening gap between rich and poor. Unlike previous generations, young people growing up today can no longer count on being better off than their parents' generation. There is mounting personal debt, a sense of frustration, and lack of hope for the future. Amongst other implications, this inequality and changed employment models – combined with demographic change - has resulted in severe pressure on the many social programs, collectively referred to as the 'social safety net.'

Even as the US economy has grown, those in the bottom half of the economy have experienced virtually no growth in income since the 1970's according to a recent study by Thomas Piketty, Emmanuel Saez and Gabriel Zucman reported in the New York Times by Patricia Cohen.²² Cohen summarized: "Stagnant wages have sliced the share of income collected by the bottom half of the population to 12.5 percent in 2014, from 20 percent of the total in 1980. Where did that money go? Essentially, to the top 1 percent, whose share of the nation's income nearly doubled to more than 20 percent during that same 34-year period." Put another way, in 1980 in the United States, the average income in the top one per cent was approximately 27 times the average income of the bottom half; by 2014 that had soared to 81 times with the average income in the bottom half, even with taxes and public programs included in the calculations.

In commenting on the research, Lawrence Katz, a Harvard economist, noted that technological change is one of the underpinning factors leading to the inequality through downward pressure on wages of low-skilled workers. He also noted that the research demonstrates the minor impact of government programs to address inequality after the fact compared to policies and programs that intervene earlier such as initiatives to increase educational levels and retain or strengthen bargaining power. While this data applies to the US, the situation in the UK and other countries is not much better.

Achieving the 'American Dream' – defined by James Truslow Adams in 1931 during the Great Depression as "that dream of a land in which life should be better and richer and fuller for everyone" is no longer a reality in many people's lives. Whereas in 1940 over 90% of babies born that year could expect to earn more than their parents, by 1980, that number had dropped to 50%.²³ The Equality of Opportunity project attributes that to two factors: overall slower rates of economic growth and inequality of distribution of economic growth, especially the latter. As David Leonhardt notes in the New York Times "In the 1980s, economic inequality began to rise, a result of globalization, technological change, government policies favoring the well-off and a slowdown in educational attainment and the work force's skill level."²⁴

Guy Standing of the University of London has written extensively about "the Precariat," the large and growing number of people in precarious economic circumstances who are not benefitting from economic growth and are facing economic insecurity on an ongoing basis.²⁵ His analysis concludes that incomes have stagnated for the bottom half of the population across the OECD for the past 30 years. The most wealthy, whom he labels the "rentiers", are gaining wealth through their assets, be that land, money, or intellectual property.²⁶ In that same article, written for the World Economic Forum, Standing notes that the income distribution system has broken down in three ways:

First, it used to be the case that when productivity grew, wages grew in parallel; now, in the US and elsewhere, wages do not budge. Second, it used to be that when profits rose, wages rose; now, wages do not budge. Third, it used to be that when employment rose, average wages did so too; now, average wages can even fall, because the new jobs pay less.²⁷

Guy Standing and others are making the strong point that the current trends are unsustainable as growing numbers of people are experiencing falling real wages, ongoing economic insecurity, and increasing frustration and anger that we're seeing play out on the political stage and on the streets. Further, these are systemic issues caused by a number of factors including technological change, globalization, demographic change and past and current public policy choices. It is not a situation individuals can fix on their own, simply by "working harder." As "Buy Me a Boat," a popular country and western song performed at Trump rallies laments: "Workin' like a dog all day ain't working for me."²⁸

The widening inequality has far reaching consequences. In his book *The Crisis of the Middle-Class Constitution*, Ganesh Sitaraman of Vanderbilt University argues that political and economic power are closely tied and the very foundation of the American constitution was based on approximate equality and a large middle class.²⁹ In an interview for *The Atlantic Monthly* magazine, Sitaraman notes that the wealthy have different interests.

*The things that are good for them aren't actually in the common good, so when they do govern, they start pursuing policies that improve their well-being and wealth at the expense of everyone else. This creates a vicious cycle, because you now have the wealthy creating a system that allows them to keep more wealth and earn more wealth, and that wealth in turn allows them to continue to take over the political system, and the cycle perpetuates....The problem with the vicious cycle that leads to oligarchy is that people are smart, and they see it happening, and they know, and they feel that the system is rigged against them. And in that context, people revolt against the system.*³⁰

3. Asymmetrical Power

Rather than being a force for inclusion and leveling of long-standing power imbalances, digital technologies have, at least in the developed world, increased the power imbalance. From the early days of the emergence of the Internet as a transformational force, the dominant view has been optimistic with respect to its leveling effect. It would disrupt a highly hierarchical pre-Internet world in which power was held tightly in the hands of a few and power structures were hard to climb and even harder to breakdown. The Internet would bring about low cost and massive peer-to-peer communication, which would enable the undermining of traditional hierarchies.

Instead, technological change and globalization have been used by business as a rationale to reduce restrictions and to lower labor, taxation and other costs to retain their competitiveness. Concomitantly, the voice of labor has been reduced as numbers shrink in many industries and as rules protecting workers (e.g. minimum wage) and organized labor have been reduced at the behest of business. Government's hands are further tied given restrictions in international agreements. As Guy Standing has written: "The transformation started in the 1980s, with a vision of open liberalized markets. Less noticeable was the strategy of dismantling institutions of social solidarity; they stood against the market. That weakened labour's bargaining power."³¹

In this context, and in the context of the Citizens United decision in 2010 by the US Supreme Court, the voice of business leaders has become more dominant as they contribute significantly to political fund-raising, sponsor research, lobby governments, and as they seek greater certainty and return for their investment in a highly competitive world. Citizens United, which ruled that political spending is protected under the First Amendment, has resulted in corporations and unions being able to spend unlimited amounts of money on political activities as long as it is done independently of a party or candidate (e.g. Political Action Committees or PACs). "As a result, a small group of wealthy donors has gained even more influence on elections, and are able to maintain that influence once candidates take office. Of the \$1 billion spent in federal elections by super PACs since 2010 [until 2014], nearly 60 percent of the money came from just 195 individuals and their spouses, according to the Brennan Center report."³²

It is not only the comparatively louder voice of business today that's a problem, it's also the narrow focus and tendency towards very short-term thinking that's problematic. The narrowing of business interests began in the 1970's when economist Milton Friedman famously wrote 'the business of business is business'. In his 1970 article for the New York Times and also in his book *Capitalism and Freedom*, Friedman wrote: "There is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits..."³³ Increasing shareholder value has become the be all and end all of most business leaders and even that is defined narrowly. "Too many CEOs play the quarterly game and manage their businesses accordingly," Paul Polman, the CEO of the British-Dutch conglomerate Unilever, noted in a recent interview. "But many of the world's challenges can not be addressed with a quarterly mindset."³⁴ By not investing in retraining for workers or research and development, business leaders who are only looking at short term returns to shareholders are creating longer term problems for their own competitiveness and the economy more broadly.

While there have been some success stories of labor, consumers, communities and interest groups being able to harness digital technologies to mount a campaign to effect change in their interests, overall the effectiveness of this participation has been spotty.

It has become clear that the original democratic architecture of the Internet has been bent to the will of economies and societies in which power is anything but distributed. If anything, the world has gotten spikier, more power dominated and entrenched. Rather than information and knowledge being more widely and democratically distributed, it is being controlled, owned and exploited by fewer entities. They are using it to control and accumulate more power. Additionally, those who are accumulating knowledge ownership and the power that comes with it are more privileged and with that privilege comes the education that produces proprietary knowledge. This privilege trumps merit, regardless of their origin. The Internet has acted as an accelerant to spiky power accumulation rather than a leveler: a distinctly pessimistic rather than optimistic outcome. And it does not appear to be slowing down.

4. Crisis of Democracy

Digital technologies have contributed to the current crisis of democracy by significantly increasing the "quantity" of participation in many respects (more information, more opinions, more channels, more money, endless election cycles) while doing little to nothing – perhaps even a negative impact - on the "quality" of democratic processes such that people are comfortable that their elected Governments represent them and that their processes and policies are enacted fairly and in the public interest. While participants in the processes (political parties, candidates, elected leaders, voters, interest groups, media) have rushed to apply new technologies and to experiment with new processes, the results have been very uneven. We've seen an explosion of networking activity on-line to bring about social change by putting forward alternative views, enlisting financial and other support, coordinating protests, and advancing social movements at the local, national and international level, but there is little evidence to date on the effectiveness of this activity. This contributes to the 'crisis of legitimacy' for our democratic institutions.

Though inspired and sometimes impactful, such networks are no substitute for structured political change. Direct democracy can't replace effective, structured, and accountable leadership. As the Arab Spring demonstrates, it's one thing to bring down a government through

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*a “wiki revolution.” It’s another to consolidate power and sustain it — a challenge that requires skilled and respected leadership, formal organization, political parties and mechanisms for sustaining support at all levels of society.*³⁵

Nevertheless, enabled by technology, the rebellious activity continues to increase. As noted by the Initiative for Policy Dialogue in 2013 “There have been periods in history when large numbers of people rebelled about the way things were, demanding change, such as in 1848, 1917 or 1968; today we are experiencing another period of rising outrage and discontent, and some of the largest protests in world history.”³⁶ As we wrote in our earlier work:

*Extreme populist movements of right, left, and various religious persuasions are increasingly gaining popular support and political power. Radicalization is the result of great disparities between expectations and reality. We may be at the start of a new era of global social upheaval that could make the Vietnam era look like child’s play.*³⁷

We argue that to restore legitimacy, government leaders need a new agenda for the digital revolution. Today the main digital focus of politicians is a cynical one — targeting voters to get elected.

That of course only contributes to cynicism amongst voters and a further lack of trust which is totally borne out by statistics showing the long-term decline of trust in government,³⁸ voter turnout³⁹ as well as the annual democracy index on the number and strength of democracies around the world.⁴⁰

Jane Mayer has written about the widespread and growing political influence of a relatively small number of powerful individuals from the ‘radical Right’ in her remarkable book *Dark Money*.⁴¹ Using a model Mayer identifies as “weaponized philanthropy,” she describes how several billionaires have been very active – often operating secretly - since at least the 1970’s in funding private foundations, sponsoring academic and other research, marketing their ideas, lobbying governments, and supporting candidates sympathetic to their views while opposing others in order to influence policy and to elect politicians at all levels. “Lowering taxes and rolling back regulations, slashing the welfare state, and obliterating the limits on campaign spending might or might not have helped others, but they most certainly strengthened the hand of extreme donors with extreme wealth.”⁴²

These techniques have included the skillful and widespread application of digital technologies. While the 2008 presidential election successfully pioneered the use of social media to reach and engage potential voters, the 2016 election has taken new steps in the analysis and use of “big data.” Big data has been used by political parties to widen, not narrow, divides⁴³ and is showing how democratic processes can be manipulated and used by special interests in other ways leading to an even deeper crisis of confidence. Jane Mayer, building upon her earlier book, has written an article for the *New Yorker* showing how the power of big money coming together with big data has influenced voting behavior in the 2016 US presidential election.⁴⁴ Amongst other actions, a single major donor contributed \$USD10 million to Breitbart news which analyzed “clicks” on its website to identify the most effective language to use against Hillary Clinton. An additional \$USD5 million from the same donor was provided to a data analytics company, Cambridge Analytica, which “uses secret psychological methods to pinpoint which messages are the most persuasive to individual online viewers....the CEO of the firm says it has created ‘profiles’ – consisting of several thousand data points – for two hundred and twenty million Americans. In promotional materials, [the company] claims to know how to use such data to wage both psychological and political warfare.”⁴⁵ Of course, those opposed to the priorities of the current administration in Washington are also turning to technology to identify and engage voters.⁴⁶

All these changes were summarized in a recent Opinion piece in the *New York Times* on democracy and the Internet.⁴⁷ Of course as noted in this article, the problem is not with the Internet itself. Quoting Sam Greene of King's College London in the article: "For reasons that are both complex and debatable, very many voters have stopped seeing government as a tool for the production of the common good, and have instead turned to politicians (and others) who at least make them feel good. Thus, the news we consume has become as much about emotion and identity as about facts. That's where the vulnerability comes in, and its roots are in our politics — not in the internet."⁴⁸

5. Ineffective Government

While results vary across policy and program areas, there is growing concern over the general ineffectiveness of government, especially in complex policy areas. While there have been some improvements in simple information and service delivery functions due to digitization and on-line services, the broader use of digital technologies have lagged in government so that efficiency, effectiveness, and service benefits possible through technology have not been fully realized. Barely touched are the possibilities to significantly transform government enabled by more effective use of information and digital technologies and emerging technologies such as the blockchain. Decision-making by government is complex and opaque. Multiple levels of government and silos within those levels are confusing and often a barrier to change. Meanwhile taxes and/or deficits continue to increase and levels of trust in government continue to fall.

As briefly referenced in the previous section, Pew Research finds that overall trust in the US federal government to do the right thing most or all of the time remains near historic lows at 19% in 2015 compared to levels approaching 80% in 1958.⁴⁹ While this is undoubtedly due to many factors, the gap between expectations and reality of government programs and services is undoubtedly a factor. Yet citizens continue to have high expectations. "Majorities want the federal government to have a major role in addressing issues ranging from terrorism and disaster response to education and the environment."⁵⁰

Some of this lack of trust in government is undoubtedly the result of the sustained campaign of the types of activities undertaken by the "radical Right" identified in the previous section. These libertarians believe in a very limited role for government and have undertaken a systematic campaign over many decades to promote that ideology. As stated by Ronald Reagan in his 1981 Inaugural address: "Government is not the solution to our problem...Government is the problem."

Some of the lack of trust in government is undoubtedly the result of real challenges to government effectiveness including outdated structures, siloed thinking, and budget constraints that, amongst other factors, limit the ability of governments to attract and retain highly skilled staff. Reducing taxes has become the mantra of politicians of almost all stripes as has the corresponding mantra within government of "doing more with less" with the inevitable negative impact on government's capability to fulfill its mandate effectively.

Although written several years ago, Jeffrey Sachs' analysis on why governments fail remains relevant today. Focusing on implementation of already settled policies, he concludes:

In short, we have arrived at a point where the challenges of sustainable development—including public health, infrastructure, energy and national security—require changes not only to policy but also to basic public management systems. In many crucial areas, tinkering will no longer suffice: we need an overhaul to regain government control over regulatory processes, reduce lobbying, restore public planning and ensure the adequate financing of skilled public managers, and align public management systems with holistic strategies.⁵¹

6. Failing Institutions

Health care, education, science and research are all critical components of any social contract because they are essential to a healthy society and a strong economy now and in the future. Yet these institutions are constantly struggling for resources and have outcomes that often fail to keep up with the requirements of a modern digital society. To be sure there are important developments in each of these areas. However, they are increasingly eclipsed by storm warnings of decline.

In many fields, jobs go unfilled because students are graduating without sufficient education or skills for these jobs. Post secondary institutions and researchers are required to pursue market-driven models which are often short-sighted. Aging populations and new technology, amongst other factors, are driving up healthcare costs to unsustainable levels in many countries with huge public policy debates on how best to address – and pay for – health care in the future. Effective implementation of digital technologies could lead to better results but are expensive and required system-wide for greatest benefit, therefore often considered unaffordable.

a. Education

Education at all levels from pre-kindergarten to post-secondary, training, and life-long learning are important to a successful digital economy and key to the individual's likelihood of success within that economy. The role of government in this sector varies around the world, but free (publicly-funded) access to at least a basic K-12 education is a policy across most western democracies as a basic part of their social contract. However, in many countries that education does not reach all children equally as schools in underprivileged areas often do not have the same resources. Some jurisdictions have included pre-kindergarten as part of public education for all children which is very important for two reasons: research which indicates how important this is for the child's development; and – in the absence of childcare programs - as an economic benefit to families, especially those that are less well off and may be burdened by expensive childcare or where one parent has been unable to seek employment outside the home due to childcare responsibilities. While that family economic benefit is not the primary purpose of pre-kindergarten, it is an important side-effect.

Today, nearly three-fourths of mothers with children under 18 now work outside the home... Unlike other nations, the United States has done little to ensure that, while America's parents are at work, their children receive the care they need. Today, it is up to the individual parent to provide whatever resources are necessary. But most workers cannot afford the quality child care and early education needed by their children. This sets up a two-tiered system in which the children of the wealthy get the care and education they need, while the children of most Americans do not.⁵²

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Questions have also been raised whether current school curricula meet the needs for the future workforce. While progress has been made in expanding the curriculum related to the STEM (science, technology, engineering and math) subjects, has it gone far enough in this direction and are enough girls involved? Also, are children learning the necessary 'soft' skills in judgement, critical thinking, innovation and creativity, entrepreneurial thinking, human interaction, and capability for life-long learning that will be so necessary in a world where many routine jobs are automated and where individuals may change jobs frequently during their life-time.

How to strike the right balance between what's publicly-funded and what should be a private responsibility is constantly under discussion, but a good argument can be mounted that a high school education does not well equip today's youth for a successful future. Some jurisdictions, especially in Europe, include post-secondary education as part of their publicly-funded education programs, i.e. their social contract. In other jurisdictions, the high and growing costs of post-secondary education are a deterrent to attendance in the first place or result in students graduating from college or university with huge debt. The students who can't afford post-secondary education will be severely disadvantaged in the future.

Many jurisdictions have expanded their college systems or funded other initiatives to provide students with practical skills for workplace readiness. While specific job-related training is generally considered to be the role of the employer, public and private colleges have played an increasing role in most jurisdictions in both training and re-training. Many students attend both college and university to gain different, but important, knowledge and skills in each environment. Germany has long been known for the success of its apprenticeship programs and the close ties between industry and the education system in identifying and addressing future needs. Undoubtedly more could be done in other jurisdictions to tighten these linkages in both directions and to design and develop new programs to meet the needs of lifelong learners.

b. Public Science and Research

Publicly-funded research, especially funding of basic science, is always under pressure. Government funded research has been severely reduced in many jurisdictions with emphasis shifting towards development in partnership with business, while universities also have been encouraged to partner with industry to ensure the relevance of their research programs and to share costs. While this has brought additional revenue to universities, it has tended to encourage applied research and development that's relevant and useful in the short-term often at the expense of basic research and the longer-term perspective with potentially negative, but unmeasurable, impacts on future innovation. It should be noted that the following [gap to be filled in] advances came from publicly-funded research.⁵³

While the US has never spent more on research and development, the government's share has never been less. That's a risky strategy. Why rely on the scattered efforts of private firms that are beholden to quarterly profit expectations to develop the next big idea?⁵⁴

In the past in the US, many important research advances have come out of the military and aerospace, including the early origins of the Internet. Under the current US administration, military expenditure is expected to increase so there may be increased research resulting from that expenditure. The question

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is how that research can be made available, by collaborating with industry and academia in a pre-competitive environment, to help propel the US economy in the fourth industrial revolution.

While most other countries do not have the leverage of this very large military expenditure, they too need to consider where their next economic advances will originate and continue to support both research and development. While many jurisdictions have had some success at establishing new development models by bringing together participants from multiple sectors, academia, and other institutions for innovation, expenditure for basic research remains a low priority.⁵⁵

c. Healthcare

A healthy society is generally considered an essential part of the social contract although models vary as to how best to meet that commitment. While most developed countries have some form of publicly-funded universal health care, the United States has adopted a model which is largely employer-based. As noted in an earlier section, that model has left many without employment-based insurance so other mechanisms have been put in place including Medicaid and the Affordable Care Act to expand coverage to more people. Discussions are ongoing in the United States about future reform and the appropriate role for government in health care.

Access to affordable healthcare remains a top priority in all countries because of its central importance to people's lives and because of rising costs which many believe are unsustainable. Like education, health touches everyone at a personal level and outcomes often do not meet expectations. "For the first time in decades, U.S. life expectancy dropped in 2015, with preventable chronic diseases remaining a leading cause of death."⁵⁶ Despite having the highest per capita health care costs amongst all developed countries, the US ranks 26th (men) and 29th (women) of 35 OECD countries in life expectancy.⁵⁷

The rankings report also found that the U.S. ranks 29th in infant mortality when compared against the other 35 nations. The infant mortality rate in 14 other countries, such as Japan and Slovenia, was half the U.S. rate. The report's authors noted that infant mortality and life expectancy rankings "continue to be disappointingly low in the United States, especially considering how much money is spent on health."⁵⁸

Another comparative study showed that US residents face significant cost barriers to health care compared to other developed countries. Commonwealth Fund President Dr. David Blumenthal notes that "the U.S. spends more on health care than any other country, but what we get for these significant resources falls short in terms of access to care, affordability, and coordination."⁵⁹

About 33 percent of U.S. adults went without recommended care or could not fill a prescription due to cost. In comparison, about 7 percent of respondents in the United Kingdom and Germany and 8 percent in the Netherlands and Sweden reported cost-related health barriers.⁶⁰

There have been many attempts to introduce universal health care in the US, including by Franklin Delano Roosevelt in 1933 as part of the New Deal and Harry Truman in 1949 as part of the Fair Deal, but these were unsuccessful in part due to employment-based insurance programs already in place and

opposition, led by the American Medical Association, to “socialized” health care. In recent years, there has been some success at improving affordable access to healthcare in the US through the Affordable Care Act but there are strong ideological differences on the role of government in health care in the US. The challenge for the US and all other countries is how to meet the health care needs for the entire population, including the large number of baby boomers reaching old age with associated higher health costs. While technology is certainly a high-cost in health care, is there a role for digital technologies to bring down overall costs and improve outcomes?

7. Fragmentation of Public Discourse

The digital age is breaking the social contract with regard to the Fourth Estate and the obligation to inform citizens. In the Industrial Age, there were limited media channels providing news and information and they did a pretty good and balanced job overall. In the US, for example, it seemed that everyone watched Walter Cronkite for news. The New York Times and Wall Street Journal were well edited, balanced (from slightly different editorial perspectives) and informed the country well, as did Time and Newsweek Magazines. Local radio, television and newspapers presented local news and information to a local audience and NPR was widely considered as an informed and balanced source. There was a clear contract in place. These outlets received a licence to operate that was consensual – an agreement between government regulating bodies, business, civil society and consumers.

Cable TV and now many digital technologies have broken this understanding by contributing to fragmentation of public discourse. This is due in part to the sheer volume of information and numbers of people participating and in part due to the explosion in the number of channels that tend to narrow that participation into digital echo chambers. While news and opinion was once curated and disseminated by journalists in print, radio, or television to mass audiences, numerous other sources of news and opinion have grown on the worldwide web that make it almost impossible to share the same information and sustain a ‘conversation’ at a societal level. Trust in the media is at an all time low, with less than half the population trusting the media in most countries including the U.S., U.K., and Canada amongst the many countries studied.⁶¹ While social media has had the very positive outcome of allowing a more diverse range of voices and opinions to become part of the discussion, with some exciting examples of social activism and citizen journalism, it has not resulted in a shared understanding of complex problems and increased consensus on how to address them.

The 2016 United States Presidential election “represents the latest chapter in the disintegration of the legacy institutions that had set bounds for U.S. politics in the post-war era....If the 2008 and 2012 U.S. presidential campaigns had seemed to confirm Internet utopians’ belief that digital tools enhance democracy by expanding citizen empowerment and engagement, the 2016 campaign highlighted the challenges that the Internet poses for American democracy, and perhaps democracy in general.”⁶²

“Free” content on-line also encourages people to migrate away from traditional media outlets, especially at the local level, which are starved for both subscriptions and advertisers.⁶³ An article in *Atlantic Monthly* notes how the number of people employed in the newspaper industry across the US has declined from 455,000 in 1990 to less than half that number by January 2017 (173,900) while the number employed in Internet publishing has grown from 77,900 in 2008 to 206,700 by January 2017.⁶⁴

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In addition to the shift from paper to on-line publishing, the location of those jobs has also changed with a much greater concentration of media jobs in the northeast US and the west coast.

Although there is more information and opinion available to each of us than ever before, that does not translate necessarily into useful knowledge or consensus. While everyone can now express their opinion, sign a petition, or respond to a survey on-line, that does not mean that opinion is reaching or persuading others beyond a narrow circle that already held these views. The volume (click) based advertising-driven model for on-line content as well as acceptance of anonymous commentary also encourage attention-seeking content including provocative and extreme content.

“Citizen Journalism” is no substitute for professional investigative journalists who are trained to seek out the truth. Previously, broadcast and print media had both the capability and the interest to reach the widest possible audience and therefore had some opportunity to build public consensus, or at least shared information. Some of the larger traditional media outlets (e.g. Guardian, New York Times) have learned how to blend traditional tools with social media and other digital technologies and are growing their audiences although not necessarily their bottom line. While the number of individual participants on social media increases, there is a growing concentration of ownership and dominance of just a few platforms. The very success of Facebook and Google encourage more and more content on these platforms.⁶⁵ Facebook and Google are building massive databases on every aspect of our online behavior that will enable them to further consolidate their dominance and therefore ability to influence directly or through clients who buy their analytics services.

In addition to all the above, there is concomitant decline in the voice of researchers, scientists, and academics as part of the public discourse. No doubt there are many reasons for this, including the sheer volume of information as well as an environment where anybody can self-publish and every opinion is seemingly given equal weight. Amongst other factors, this has led to the politicization of issues such as climate change or vaccinations, especially in the very contentious US environment, which might in other generations have had public consensus as the result of the research and recommendations of expert scientists combined with respectful public debate and discourse led by trusted policy-makers. If that environment ever existed, it certainly no longer exists in the digital economy.

Finally, there is growing evidence that the current divisiveness of public opinion has been accentuated deliberately by various special interests to support their own specific goals. As noted in a previous section, people have learned how to ensure their information appears at the top of search engine results; how to use data analytics to understand and influence opinions and behaviors; how to find and promote negative news and opinions about others; and how to plant false news stories to influence opinion, change the topic and/or deliberate confuse the debate. These trends are accentuated by the use of automated messages or ‘bots’. Nathaniel Persily of Stanford University notes that:

During the 2016 campaign the prevalence of bots in spreading propaganda and fake news appears to have reached new heights. One study found that between 16 September and 21 October 2016, bots produced about a fifth of all tweets related to the upcoming election. Across all three presidential debates, pro-Trump twitter bots generated about four times as many tweets as pro-Clinton bots. During the final debate in particular, that figure rose to seven times as many.⁶⁶

The interesting – and scary - thing is that these tactics appear to work.

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Trump has discovered something about epistemology in the 21st century. The truth may be real, but falsehood often works better.... In the radical democracy of social media, even the retweets of outraged truth squadders has the effect of rebroadcasting false messages. Controversy elevates message...

TIME reviewed the 298 tweets Trump has sent since being elected President as of March 21. Fifteen included clear falsehoods, like the wiretap claims. The false messages were retweeted an average of 28,550 times. Those that were not clearly false were retweeted on average 23,945 times. The viral effect of falsehood being repeated on the news was many times more pronounced. According to a search through the Internet Archive, a nonprofit library database, the false tweets were quoted on television an average of 31 times, more than twice as often as other tweets.⁶⁷

It should be noted, as the Time article points out, these tactics have become much more apparent during and after the 2016 US presidential election, but they're not limited to Donald Trump and the Republican party.

A Pew Research study makes some interesting observations on the growing sophistication and use of algorithms analyzing the vast and growing amounts of digital data. They surveyed more than 1300 experts studying and working in the field of data analytics and found:

Two connected ideas about societal divisions were evident in many respondents' answers. First, they predicted that an algorithm-assisted future will widen the gap between the digitally savvy (predominantly the most well-off, who are the most desired demographic in the new information ecosystem) and those who are not nearly as connected or able to participate. Second, they said social and political divisions will be abetted by algorithms, as algorithm-driven categorizations and classifications steer people into echo chambers of repeated and reinforced media and political content."⁶⁸ Referring to the 2016 US Presidential election, "XPrize Foundation CEO Peter Diamandis predicted that 'five big tech trends will make this election look tame.' He said advances in quantum computing and the rapid evolution of AI and AI agents embedded in systems and devices in the Internet of Things will lead to hyper-stalking, influencing and shaping of voters, and hyper-personalized ads, and will create new ways to misrepresent reality and perpetuate falsehoods."⁶⁹

While the authors foresee several positive trends in the growing sophistication and use of algorithms and data analytics (e.g. data-driven approaches to problem solving), they also identify many concerns including potential for in-built biases and deepening divides. They call for increased "algorithmic literacy, transparency and oversight."⁷⁰

People know the fragmentation of public discourse is happening and, even if they wanted to, have little confidence to counteract it. The 2015 Pew Research study on trust in government also asked respondents whether they had confidence in their own collective political wisdom. "Just 34% say they have a very great deal or good deal of confidence in the wisdom of the American people when it comes to making political decisions, while 63% have little or no confidence. In January 2007, these opinions were almost the reverse – 57% had at least a good deal of confidence in the political wisdom of the people, while 41% did not."⁷¹ This response came from across political lines.

8. Privacy and Security Challenges to the Autonomy of the Individual

Big brother is a reality. Digital technologies, including big data, have led to an unprecedented loss of personal privacy, loss of control of personal information, and new threats to our personal autonomy and security. As daily living increasingly takes place on-line, large companies are harvesting our digital footprints, storing the information in huge data warehouses, analyzing the data from many perspectives and/or selling it to others to sell us a product or service, offer us personalized content, persuade us to vote in a certain way, or understand and predict or influence our future actions amongst other uses. This is not limited to the obvious electronic trails such as on-line shopping, or use of a credit, debit or loyalty card, or clicking on “like” or “dislike” or tracking our browsing history. As everything becomes connected, it also includes health information through monitoring devices, our DNA when we’re seeking to understand our genealogy, where we drive, who lives in the same household, what time we leave and return home, where we go, and what temperature we like for our homes amongst many other factors. It includes the linking of data bases developed for many separate purposes bringing together many data points on a single individual which separately may have had little meaning beyond the original purpose, but when combined paint a comprehensive picture. Digital cameras are deployed all over our city streets, transit systems, highways, and buildings capturing our every movement; when combined with increasingly powerful facial recognition that information can be readily personalized.

While privacy laws exist in most jurisdictions, these laws are struggling to find the right balance and their enforcement is increasingly impossible. While European jurisdictions are endeavouring to keep up with modern technology to regulate companies operating in Europe and protect personal privacy, the US is moving in the opposite direction as it relaxes rules around data tracking and sharing by Internet Service Providers (ISPs). Even when offered the choice, many people do not ‘opt out’ of data collection and even are willing to click their consent to share personal information in exchange for what they see as a benefit, yet they’re likely unaware of how their information is being shared, sold and used. In addition to the use of data by commercial players with whom they do business, the data may also be made available to data brokers and sold to anyone, including governments. While there are laws in place about government surveillance over its own population, there are few rules if any about the purchase of data held by others in “public data bases” by government agencies, for example by the police who may use that data for population profiling. It’s increasingly looking like the 2002 movie “Minority Report” got it wrong; the movie’s depiction of the “PreCrime” unit in 2054 appears to be happening much more quickly than predicted in that Sci-Fi flick.

The digital economy has also opened up new threats to personal security. Everyday there are more examples of major cybercrimes, on-line scams and other fraudulent behavior including identity theft based on digital footprints left on-line. Criminals and terrorists use data encryption and other digital technologies as they coordinate their activities on-line. Hackers have released highly personal and private information found stored on people’s electronic devices while others have taken hold of computers seeking ransom. Bullying is a significant issue on social media as bullies have a ready-made platform through social media to harass 24/7 regardless of location. This bullying is often anonymous which seems to embolden the bully and can have very serious consequences, up to and including suicide by vulnerable individuals bullied on-line.

Beyond the basic loss of privacy and threats to security, these trends should be of concern to us for a number of reasons several of which we’ve noted in earlier sections including loss of control of who has access to information about us and how it is used; data profiling and/or surveillance by commercial or

government bodies without our knowledge or consent; data analysis using unknown algorithms that can be highly misleading and lead to surprising, even harmful, results; and others profiting from information which is rightfully ours. Two companies in particular – Facebook and Google – with their millions of daily visitors leaving breadcrumbs all over the WWW are making billions of dollars from this data by selling targeted advertising. According to an article in the Washington Post quoted in the New York Review of Books, Facebook maintains 98 data points on each of its members based on our own activities on Facebook, (including photos or information about us posted by others), as well as information they purchase from any of approximately 5000 data brokers who sell information from any of 10 million public data sets. “These ad choices are the coin of the Facebook realm.”⁷² In 2016, Facebook made almost \$27 Billion from advertising, up by 57 percent from the previous year.⁷³ We have entered an era of “surveillance capitalism” with many companies making large amounts of money based on data we’ve knowingly and unknowingly provided.⁷⁴ While questions are increasingly being raised about the “return” on this advertising expenditure and also the risks to the advertiser of being placed beside highly questionable content, the overall trend towards greater use of our personal data by others is clear.

Some people say – forget about privacy; it’s impossible in the digital era and I don’t have anything to hide anyway. In his well-known TED talk in October 2010, Glenn Greenwald reminded us of just how much we do value our privacy and why it matters. He noted the danger of assuming that people who care about privacy must have something to hide and used examples of how even the executives of Google and Facebook care very much about their own privacy. He also notes privacy is essential for democracy to flourish, with significance far beyond the secret ballot.

...a society in which people can be monitored at all times is a society that breeds conformity and obedience and submission, which is why every tyrant, the most overt to the most subtle, craves that system. Conversely, even more importantly, it is a realm of privacy, the ability to go somewhere where we can think and reason and interact and speak without the judgmental eyes of others being cast upon us, in which creativity and exploration and dissent exclusively reside, and that is the reason why, when we allow a society to exist in which we're subject to constant monitoring, we allow the essence of human freedom to be severely crippled.⁷⁵

9. Challenges to Our Biosphere

Digital technologies contribute to environmental problems and can also play a positive role in many ways to address environmental challenges. Previous social contracts have been generally silent on the environment, but a meaningful social contract for the digital economy must include environmental sustainability now and for future generations. We no longer take the natural environment for granted and it is widely understood that ignoring the environmental impact of our actions has had severe negative consequences. In fact, on its 70th anniversary in 2015, the United Nations adopted a major plan to end poverty, protect the planet, and ensure prosperity for all entirely under the umbrella theme of sustainability: “Transforming our world: the 2030 Agenda for Sustainable Development”.⁷⁶ This plan includes 17 sustainable development goals, and 169 targets, that cut across all aspects of life on our planet including affordable and clean energy, sustainable cities and communities, responsible production and consumption, and action on climate to be implemented by member countries over the next 15 years.⁷⁷ As stated in the Agenda document:

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Natural resource depletion and adverse impacts of environmental degradation, including desertification, drought, land degradation, freshwater scarcity and loss of biodiversity, add to and exacerbate the list of challenges which humanity faces. Climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development. Increases in global temperature, sea level rise, ocean acidification and other climate change impacts are seriously affecting coastal areas and low-lying coastal countries, including many least developed countries and small island developing States. The survival of many societies, and of the biological support systems of the planet, is at risk.

Digital technologies have been part of the problem. Data storage, processing and transmission, all increasing as digital technologies become more pervasive across all sectors, consume large amounts of energy, and rapid technological change combined with consumerism has led to frequent product updates and massive amount of electronic or “e” waste. Perhaps surprisingly, in 2013 it was estimated that information technology consumed approximately 10% of the world’s energy.⁷⁸

In his report, Mills estimates that the ICT system now uses 1,500 terawatt-hours of power per year. That’s about 10% of the world’s total electricity generation or roughly the combined power production of Germany and Japan. It’s the same amount of electricity that was used to light the entire planet in 1985. We already use 50% more energy to move bytes than we do to move planes in global aviation.⁷⁹

More broadly, digital technologies have enabled mass production and the global economy with both positive and negative consequences. With respect to the environment, in addition to the use of carbon fuels in both production and transport, globalization has been used as an argument against environmental protection measures as well as a driver for investment in new sustainable technologies.

Given all of the above, both positive and negative, it is therefore critical that we include the environment and our impact on the biosphere in the new social contract for the digital economy.

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It is clear that the post World War II social contract is no longer working; so what do we replace it with and how do we get there...quickly? How can we avoid massive social disruption or worse? Are our western democracies destined to become ever more fragmented with no unifying concepts or principles regarding how we choose to live, work, and play together while sharing the same spaces and protecting our natural environment for future generations? How do we handle the fact that even the very concept of democracy as the best means of organization is increasingly under question by younger generations? “Across numerous countries, including Australia, Britain, the Netherlands, New Zealand, Sweden and the United States, the percentage of people who say it is “essential” to live in a democracy has plummeted, and it is especially low among younger generations.”⁸⁰ While 72 percent of Americans born in the 1930’s believe that democracy is essential, only 30% of those born since 1980 in the US share that belief.⁸¹

In a December 2016 ‘Leader’ on the future of liberalism, the Economist wrote of the need for vision and leadership today just as was needed in the late 19th century with the technological, economic, social and political turmoil being faced at that time.⁸² While some saw authority, protectionism and the slowing down of change as the best way to go, the liberal viewpoint that power should be dispersed and individuals enabled to choose what is best for themselves under the rule of law and in competitive markets carried the day. But this direction was based on a fundamental belief in progress, that overall the world and people’s lives are changing for the better. Many people in many western countries, including the United States, no longer share that belief. As we’ve seen in the earlier sections of this paper, many have not seen income growth in many years, technology has eliminated many jobs permanently, they are frustrated with their political leaders to address their needs fairly, and they are no longer optimistic for a better future.

If it is to thrive, liberalism must have an answer for the pessimists, too. Yet, during those decades in power, liberals’ solutions have been underwhelming. In the 19th century liberal reformers met change with universal education, a vast programme of public works and the first employment rights. Later, citizens got the vote, health care and a safety net. After the second world war, America built a global liberal order, using bodies such as the UN and the IMF to give form to its vision.

*Nothing half so ambitious is coming from the West today. That must change.*⁸³

The remainder of this paper is all about that big challenge: what is the new social contract that should guide the digital era? What do we need to change going forward so we continue to progress in a way that is more inclusive and more sustainable from an economic, social, and environmental perspective? In this section, we introduce what we believe are the key directions for a new social contract – a contract based on recognition of our mutual interdependence. We hope this will be a starting point for further discussion and debate about what needs to change in our current concepts and how we relate to one another. In the following section, we introduce many specific solutions that we believe could begin to bring that new social contract into reality.

All segments of society – government, business, civil society, and individuals wearing all our hats - have a role to play in addressing our current challenges and restoring confidence. Coming together through local, national, and global solution networks is required to develop, test, deploy and measure innovative approaches to wicked problems and, in so doing, a new way of thinking about and working together in the digital economy. “Only by breaking out of these silos and engaging each other in honest dialogue can we hope to build a more equitable, productive and inclusive economy. The social contract framework—the notion that different components of society make particular concessions to one another in order to realize a greater mutual benefit—has much to offer: It reminds us that we have the opportunity—and perhaps the obligation—to construct a society that works for ourselves, our fellow citizens, and the next generation.”⁸⁴ While selfishness and “looking out for number 1” may work for the short term, neither individuals nor business can succeed in the long term in a world that’s failing. Although it’s not the first time this phrase has been used, it is very appropriate in this context: we call for a “Declaration of Interdependence:”⁸⁵ Citizens of the world unite...seriously....for only by working together across all segments of society can we build a strong and inclusive society and economy where every individual has the opportunity and potential to lead a happy, healthy and productive life!

Four Pillars of Society

So what's different? Isn't it obvious that we are dependent upon each other and therefore must all recognize and support this interdependence as we live, work and play together in today's complex world? Actually, it can't be that obvious if, as illustrated in the previous section, we've seen business step back and take less and less social responsibility starting in the 1980's.⁸⁶ During the same period, in a vicious circle, the legitimacy of government has increasingly been called into question as its capability to perform its functions has been systematically weakened. While individuals and civil society have been active, enabled in part by digital technologies, their voice has been significantly weakened. This section proposes what the major role for each of these four "pillars" should be in a new social contract. It's not radically different from "what once was" but emphasizes a few changes from today, especially that the private sector DOES have a "public" responsibility; the state DOES have a legitimate and important role; and the civil society is not an afterthought but a significant and legitimate "player". All of these can be linked together by multi-stakeholder networks.

1. The Private Sector

Underpinning the proposed new social contract for the digital economy is the renewed recognition and acceptance of the private sector as a major pillar of the social contract. The private sector is the primary driver of economic growth and a major contributor to wealth distribution, a functioning democracy, and a healthy environment. In the past, the private sector has been – in its own interests and in the interests of society overall – a major participant in a functioning social contract and it must return to that role. Business needs to be a responsible participant in the community(ies) in which it operates at the local, national and international level. The shareholder perspective, so strong since the 1980s, needs to be balanced with the perspective of other stakeholders especially labor, with an emphasis on value creation both now and in the longer term. "A key lesson we have learned in our research is that business has an especially powerful role to play in showing how to get concrete results by working together. In addition to producing high quality, innovative solutions to meet their customers' needs and desires, businesses can also support—or subtly destroy—the middle class and democracy that are at the heart of our culture, and at the heart of their own sustained success."⁸⁷

2. The State

Government, or 'the state' is also a pillar of the new social contract, drawing its legitimacy from the people and acting to meet the overall public interest. While political philosophies on the appropriate role of the state are debated constantly and do vary, there is broad consensus that there is a necessary and important role for the state in any organized society. In exchange for provision of basic infrastructure and services to support inclusion in a strong economy and society, safety, security, and ongoing conflict resolution, we support and subject ourselves to the rule of law as defined by our

elected representatives and fairly applied by the public service. “The core of the new era is this: If you want to preserve the market, you have to have a strong state that enables people to thrive in it. If you are pro-market, you have to be pro-state. You can come up with innovative ways to deliver state services, like affordable health care, but you can’t just leave people on their own. The social fabric, the safety net and the human capital sources just aren’t strong enough.”⁸⁸

3. The Civil Society

The third sector, as it’s sometime called, is also an important pillar in the social contract for the digital economy. It is an important means through which people self-organize in various ways to give expression to their beliefs (e.g. religious institutions), share common interests (e.g. social and recreational organizations), or address identified issues and priorities (e.g. charities that address social issues at the local, national or international level). Civil society, as the name suggests, strengthens and builds social cohesion through the opportunities it provides for public discourse, shared experiences and problem solving. It has and will continue to have an important role. Both the state and the private sector have at various times in various jurisdictions acted to strengthen or weaken civil society and its institutions (e.g. through tax policies, partnerships, or off loading without commensurate resources).

4. Individuals

The fourth pillar of the social contract is individuals themselves who also have a voice and a role to play. That often takes the form of active participation through the first three pillars as entrepreneurs, managers and workers; taxpayers, voters and elected representatives; donors and participants in community groups. It also includes our roles as parents, leaders and participants within society, and the values we have and demonstrate to others through our words and actions. Whether our values tend towards the highly individualistic or towards the strongly communal, we need not be simply passive participants in society; we can choose to help shape and continuously improve the policies and framework within which we live and work together.

Multi-Stakeholder Networks for Global Problem Solving

Given that the private sector, government, civil society and individuals all have a role to play in developing a new social contract and putting it into practice, how can they come together? Are the existing institutions, as weak as they are, the only route forward? We believe this is already emerging through multi-stakeholder networks which we first defined in 2013:

There is a fundamental change underway regarding how global problems can be solved, and perhaps how we govern ourselves on this shrinking planet. Emerging non-state networks of civil society, private sector, government and individual stakeholders are achieving new forms of cooperation, social change and even the production of global public value. They address every

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conceivable issue facing humanity from poverty, human rights, health and the environment, to economic policy, war and even the governance of the Internet itself.”⁸⁹

These networks are, of course, enabled by digital technologies which allow them to connect, share information, and collaborate on solutions.

In the next section, we propose a set of principles to guide the new social contract and to respond to the nine disruptions discussed earlier in this paper.

A New Social Contract for the Digital Economy: New Directions

In this manifesto, we have talked about the breakdown of our post WWII social contract as evidenced by numerous serious challenges and why it is important to initiate the dialogue on a new social contract going forward. We have also proposed that the new contract recognize and affirm the mutual interdependence of all pillars of society, each of which has an important role to play. In this section, we suggest the new directions that we propose for a new social contract. We introduce these new directions in the table below which pulls together in one table for easy reference: what was the assumption upon which the previous social contract was based (column 1); what has changed (the disruption) to cause that to break down (column 2); and what should be the new direction (in bold; column 3). To illustrate the new directions, we also include in the third column some top level suggestions of how to begin to implement each of the changed directions. These suggestions will be discussed more fully in the next section. Just as digital technologies have contributed to the challenges we face today and the breakdown of the old social contract, digital technologies will have an important role to play in successfully implementing a new social contract.

New Directions: A Social Contract for the Digital Economy		
“Old” Social Contract	Disruption/Challenge	“New” Social Contract Directions
Reliance on full time jobs and full employment as the primary vehicle to distribute wealth and other benefits such as health care and long term income security	Structural Unemployment: Increasing number of `precarious`workers and pervasive structural unemployment putting more people at economic risk as well as undermining their identity and confidence; sub-optimal decision-making due to importance of benefits tied to “job”.	1. Rethinking Work Encouraging new jobs in the fourth industrial revolution. Greater emphasis on importance of wealth creation and job mobility; wealth distribution, benefits and income security de-coupled from permanent full-time employment through universal basic income and a portable safety net.

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	<p>Robotics and artificial intelligence are advancing at such a pace that large numbers of jobs are being permanently displaced. Learning machines will soon surpass human capabilities creating new risks.</p>	<p>A code of ethics is required to guide development of AI.</p>
<p>Governments, through policy and taxpayer dollars, provide social safety nets to protect people left out of the economy, including the unemployed, poor, sick, disabled, and elderly</p>	<p>Growing Inequality Growing income inequality is putting many more people at risk. Large and complicated programs are expensive, confusing, uncoordinated, and often ineffective. They're also frequent targets of competing political philosophies, with abrupt changes in criteria and funding.</p>	<p>2. Pre-Distribution of Wealth Include more people in the formal economy who are currently excluded through technology.</p>
<p>Business and labor viewed as important pillars of social contract; businesses provide jobs, income and other benefits to workers who are active stakeholders in the workplace as well as consumers and part of a growing middle class. Organized labor also viewed as important component of social contract ensuring voice of labor in key decision-making.</p> <p>Sovereign governments set policies within their jurisdictions in the public interest with a reasonable expectation of their effect</p>	<p>Asymmetrical Power Since 1980s significant rise in the power of the shareholder and decline in the power of labor with greater emphasis on short term value to investors than other economic measures. Industrial technology controlled by powerful forces. Globalization of trade, mobility of investment (more than labor); trade agreements that give rights to international businesses that may supersede local laws; global competitiveness putting pressure on wages and organized labor.</p>	<p>3. Democratic Ownership Through policy and tangible steps, reaffirm business as an active participant in the social contract to reflect that businesses benefit from, and are responsible to, a healthy local, regional and national workforce, economy and society now and for the future. Strengthen voice of labor, community, and other stakeholders in policy and business decision-making.</p>
<p>People trust their elected Governments to represent them and act in the public interest. Government processes are fair, open, transparent and accountable.</p>	<p>Crisis of Democracy Democratic institutions increasingly accountable to funders not citizens, processes opaque and citizens passive. Government leaders react to polling; perceived lack of leadership. Loss of trust in politicians at the same time as</p>	<p>4. Participatory Democracy Re-affirm principle of strong democratic institutions as an essential pillar; introduce mandatory voting (where it doesn't already exist); Implement principles of openness, transparency and accountability. Implement</p>

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	there is a rise in grassroots movements and a perceived rise in populism.	strong election finance reform to free democracy from big money.
Citizens consent to let governments enforce laws, establish programs, and provide infrastructure and services in the public interest paid for through taxation.	Ineffective Government Growing gap between public expectations and delivery leading to loss of trust in governments to spend taxes wisely and cost-effectively in the public interest.	5. High-Performance Government Strengthen government’s capability to plan, manage, and implement effective programs and services in the public interest. In so doing, re-affirm the legitimate role of government as a key pillar.
Strong public-private institutions including education, health care and science and research contribute to a healthy society and economic growth. Free access to basic education for all (usually understood as K-12). Good healthcare accessible to everyone at affordable cost.	Failing Institutions Increasingly unsustainable health costs are rising faster than improvements in health outcomes. Education fragmented with uneven results. Widening gaps in access to quality education at all levels. Basic education is no longer sufficient to participate in rapidly changing digital era economy. Industrial era pedagogical models no longer appropriate. Public funding for research and science being squeezed as governments have encouraged market-driven approaches.	6. Collaborative Institutions Affirm support to public education as a foundation of a healthy economy, collaborative science and research, and affordable health care for all. Strengthen collaboration within and across institutions for better outcomes.
Active and diverse free press across multiple channels providing information and laying the groundwork for a shared understanding of complex issues. Value placed on evidence-based decision-making.	Fragmentation of Public Discourse With rise of digital society, lots of information from a wide variety of sources with many beneficial results. Multiple competing sources of information on-line often with little critical analysis; intentionally false information; narrowcasting in echo chambers to affirm opinions; and cyber bullying amongst other trends. “Free” information on-line is breaking down business model for	7. An Informed Society Increase access and participation on the WWW; increase transparency and accountability for information and processes on-line; improve capacity for critical analysis; re-affirm public support and respect for science and research and a strong “fourth estate” in support of evidence-based decision making.

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	traditional media; breakdown in social discourse exacerbated by social media	
Individual Freedom: right to personal privacy, security and autonomy.	<p>Personal Autonomy Threatened Loss of control of personal information and identity in a digital era. In addition to growing cybercrimes, including fraud and identity theft, large-scale commercialization of personal data often without knowledge of the individual.</p>	<p>8.Digital Age Identity Personal control over personal information and identity through a personal avatar and ongoing security of the person and their information</p>
In period of perceived abundance and unlimited resources, little to no reference to environment in previous social contract.	<p>Challenges to our Biosphere Climate change and pressure on the natural environment (air, water, habitats, species at risk) from human activity</p>	<p>9.Resilient Biosphere Numerous digital technologies across all sectors, especially power, building management and transportation will support increased sustainability of our environment at the micro and macro level.</p>

A New Social Contract for the Digital Economy: Solutions

Based on the core concept of Interdependence, and the new directions in the above table, this section proposes how a new social contract could be put into practice aided, in part, by digital technologies. While digital technologies have undoubtedly contributed to many of the challenges, they will also be a significant part of the solutions. Just as the new directions are inter-related, several of the proposed solutions are overlapping or serve more than one goal. This only makes sense in our complex and interdependent world.

1. Rethinking Work

The overarching theme to pursue under the direction of a more democratic economy/rethinking work is where will the new opportunities be for human employment in the fourth industrial revolution, how do we encourage those jobs, and how do we manage the shift? Is our economy only about delivering goods, services and innovation? Or does it also have a role to play in creating employment? As up to 50 percent of activities now currently performed by humans are

eliminated over the next few decades, where will our human ingenuity, creativity, and emotions be applied and how can we manage the labour force disruption that results? In addition to the McKinsey study referenced earlier⁹⁰, others are predicting that AI and robotics will open up many new opportunities just as automation has done in the past. In a book recently reviewed in the New York Times, Luke Dormehl examines this and predicts “Barring some catastrophic risk, A.I. will represent an overall net positive for humanity when it comes to employment.”⁹¹ The private sector, governments, and researchers and academia all have a role to play in identifying where these opportunities will be and encouraging investment and employment, as well as preparing a workforce ready to take these jobs. Governments especially need to get much smarter in understanding where the economy is going and designing new measures – and eliminating old ones – appropriate to the digital economy.⁹²

There have always been optimists and pessimists and we’ve always leaned towards the optimistic. However, the rate of technological change happening now and in the next several years is unprecedented. There are many who are predicting a more pessimistic future with permanent structural unemployment or at least under employment with, under any scenario, many losing their jobs who will not be taken up by the new economy. As a result, there is a large and growing precarious workforce, structural unemployment and many people being displaced through automation, artificial intelligence and robots. Elon Musk for example argues that governments will have to introduce Universal Basic Income as the result of the job displacement due to automation and artificial intelligence. “I don’t think we’re going to have a choice,” he said. “I think it’s going to be necessary. There will be fewer and fewer jobs that a robot cannot do better.”⁹³

Under these circumstances, we propose that it is important to de-link economic security from full-time employment and we propose two separate but related measures: a universal basic income (UBI) and a portable safety net.

The first proposal comes under various labels in addition to UBI including guaranteed annual income, guaranteed minimum income, basic income guarantee, unconditional basic income, or negative income tax amongst others, but the basic idea is the same – ensuring that everybody has a level of income security regardless of their employment or other status. While the proposals vary in precisely how they’d be implemented, the UBI is usually proposed as unconditional funding to replace many, if not all, of the numerous siloed and application-based programs that governments have built up over the years to address specific needs (e.g. child support, housing support, food stamps, etc.).

This idea has been argued in the literature for years and even implemented, usually on a pilot model basis, in some jurisdictions, with perhaps the earliest example being in 1970s Dauphin, Canada. The call for a UBI from thinkers on both the left and right is becoming much louder at this time due to the increasing numbers of precarious workers, the structural unemployment expected to grow with increasing automation in the future, as well as other trends such as an aging population and issues related to impoverished seniors. We believe it is an idea whose time has come and note that there is an excellent opportunity to study and learn from UBI pilots being initiated in Finland,⁹⁴ Ontario,^{95 96} and other jurisdictions.⁹⁷

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Many arguments have been put forward both for and against UBI. Supporters of a UBI propose that it is the best model to provide income security from a macro and a micro economic perspective, that it would restore dignity to the individual by putting choice of how to spend their funds back into the hands of people, and it would reduce administrative complexity and costs. Others argue that a UBI is too expensive to be sustained, would increase dependency, be a disincentive for people to work, undermine organized labor and the hard work already invested to achieve worker benefits, and be a barrier to necessary economic transformation in the fourth industrial revolution.

Some are strongly opposed to the idea for political as well as practical reasons. Anke Hassel, of the Hertie School of Governance suggests that the concept of UBI is a 'dead end' due to the high cost and the incentives it would bring to do things that are not best for the long term: "it's a seductive poison that benefits the margins of society at the expense of the middle class."⁹⁸ She argues that the concept would cause further social divides, block social mobility and would not be supported by the public in any case as it lacks social legitimacy. She references a recent Swiss referendum that roundly rejected the idea.

Laura Pennacchi, a former politician in Italy and now coordinator of the National Economy Forum of CGIL, the largest trade-union in Europe, writes in a recent article:

The justification for "universal income" often takes the form of "well, there are no jobs anyway, and there won't be any in the future either, or what there is will just be menial". However, this justification makes the "citizen's income" a kind of resigned acceptance of reality as it is, paradoxically sanctioning and legitimizing the status quo. As a result, no one need feel the need to demand deeper changes, and there is a ready-made justification for the public sector to throw off more and more of its responsibilities, as any administrator finds it easier to make a monetary transfer than grapple with the problems of maintaining, rebuilding and strengthening a social fabric that is vast, complex and structured. Western societies would be destined to become "jobless societies.... There is almost no attempt in this perspective to combine an analysis of the changes with an observation of the structural elements of how accumulation and production function in the destructive neoliberal version of the capitalist system."⁹⁹

On the other hand, Guy Standing of the University of London, in a recent paper for the World Economic Forum¹⁰⁰ and in an article for The Guardian newspaper, makes the case for why a UBI is not only necessary, but also urgent given that "the 20th century income distribution system has broken down irretrievably."¹⁰¹ Considerable effort was devoted to the topic at the 2017 WEF forum in Davos with many calling for a UBI as referenced in the closing summary.¹⁰² Addressing specific concerns raised by some representatives of organized labor, Daniel Raventos and Julie Wark in Counterpunch, have systematically countered these arguments to conclude that a UBI is the best way forward at this time.¹⁰³ Calls for a UBI are not solely coming from academia and think tanks as we've already seen from the Government commitments in Finland, Ontario and elsewhere. At a recent forum in Dubai, Elon Musk also commented: "I think universal basic income will be necessary, but the much harder challenge is: How will people then have meaning?"¹⁰⁴

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On balance, we believe that the arguments for a UBI outweigh the disadvantages and propose that it be done in addition to, not instead of, other measures designed to support increased income security through employment including a “portable safety net.” Much can and will be learned through pilots already underway and planned with the lessons learned from these initiatives applied to future UBI implementation on a wider scale.

Our second major proposal under the heading “rethinking work” is for a “portable safety net” to restore social security to those who are working but may not be receiving benefits from their employer. It will restore benefits to those who work in multiple jobs and who change jobs frequently as contractors, free lancers and part-time workers. Such a measure will help to stabilize the economy by restoring the responsibility of all employers to support their workers with reasonable wages and benefits by eliminating loop holes that have encouraged some employers, especially those in the so-called ‘sharing economy’, to hire part time workers and reduce or eliminate benefits entirely. It will also eliminate the “golden handcuffs” incentive which encourages people to stay in jobs too long when they could be pursuing other opportunities or be more productive elsewhere. Most importantly, it also re-establishes the economic security that was part of the “new deal.”

A portable safety net is not a new idea with various models out there regarding what’s included and how it would work; it’s a matter of political will to get it done. One model, developed by Steven Hill, is based on already existing multiemployer benefits plans in many industries. It would establish Individual Security Accounts which all employers would pay into depending on the number of hours worked.¹⁰⁵ Such a program, along with policy changes to eliminate some arbitrary rule differences between different types of workers would bring significant benefits to workers and the economy overall. Of course, such a scheme would not be possible to implement without modern information management and technology to support the accounting that goes along with each individual security account.

Another aspect of the growing use of robotics and advances in artificial intelligence and blockchain should also be addressed in a digital era social contract: a code of ethics. As machines are increasingly taking on functions formerly performed by humans, including what were once considered complex tasks requiring human judgment (e.g. assessing applicants for employment or health diagnoses), it is important to understand the formulae or algorithms that drive these processes to ensure there is transparency regarding the assumptions, data and how the algorithm works, fairness and incorruptibility amongst other factors.¹⁰⁶

Also, as machines are increasingly able to ‘think and learn’ at a much faster rate than humans, many reputable scientists and other thinkers are beginning to raise ethical questions that were previously only the subject of science fiction, i.e. ‘who’s minding the machines’ and ‘what protections are there that intelligent machines won’t harm humans’?¹⁰⁷ As technologies fuse across the physical, digital and biological spheres in the fourth industrial revolution, what are the ethical guidelines to be applied to biotechnologies and where they’re applied? While robots, AI and biotechnology have already brought us tremendous benefits across virtually all sectors with many more yet to be developed, it is time to think about a code of ethics for research and development in robotics and artificial intelligence to help avoid, or at least minimize unintended negative consequences. Given the large body of specialized work underway on this topic, we do not propose such a code in this paper. Rather we simply flag the

issue and endorse the development of such a code through broad consultation and the inclusion of robotics artificial intelligence and biotechnology as a new element of a modern social contract.

2. The Pre-distribution of Wealth

Today the main proposal to address growing economic inequality is to redistribute wealth – to tax the rich and distribute money to the rest. Setting aside the merits and disadvantages of this idea, the digital age is introducing a new concept. Rather than rebalancing, it is now possible to “pre-distribute wealth” to change the way that wealth is created and captured *a priori* rather than an *a posteriori* rejigging.

As a necessary pre-condition to the pre-distribution of wealth and as a means to increase participation in the digital economy more generally, we first need to ensure universal access to high-speed broadband so everyone has the capability to participate. This idea is not new, with many countries having broadband policies, including funding,¹⁰⁸ but implementation of these plans is far from complete. Often policy-makers and funders, assuming the task is complete or will be complete in the near future as the result of market forces, have moved on to other priorities. Usually it is rural areas and small towns where high-speed service is not available and/or very expensive, areas of course which also experience high unemployment but gaps continue to exist even in the largest cities. Without repeating the excellent work already done on this topic, it is perhaps more important than ever before that we address this gap as more jobs are becoming fully digitized and could be done from anywhere high-speed broadband is available. It’s not (just) about individuals developing new products and services and selling them from a small town or their kitchens; why move jobs offshore when they could be done down the street?

The second proposal to address income inequality is to enable people to monetize their information and other assets rather than having businesses use them primarily for their own commercial gain. This is now possible through blockchain technologies as Alex Tapscott and I wrote about in our recent book *Blockchain Revolution*¹⁰⁹ and as I spoke about in a recent Ted Talk. In that talk, I addressed the problem of inequality and how our only approach today is to redistribute wealth after the fact through taxation and various benefits programs. “Could we **predistribute** wealth? Could we change the way that wealth gets created in the first place by democratizing wealth creation, engaging more people in the economy, and then ensuring that they get fair compensation?¹¹⁰” There are many ways this can be done, including:

- putting land titles on the blockchain to ensure that the rightful owners of land are able to utilize and be fairly compensated for this asset. This is especially important in the developing world, but also beneficial in developed countries;
- eliminating the middleman to create a true “sharing economy” and enabling direct peer-to-peer transactions on assets ranging from available rooms, transportation, or underutilized equipment;
- eliminating the middleman in personal financial transactions such as remittances;

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- enabling creation and protection of our digital identities in our own “digital black box” which allows each individual to decide what information they wish to share with whom and for what compensation, if any;
- fixing the broken intellectual property model by using the blockchain to ensure that creators (of art, music, books, etc.) are properly compensated for their work; and
- creating a new halcyon age of entrepreneurship where large numbers of the population create wealth and share from it. Because of networks, especially blockchain, small companies can increasingly have many of the advantages of large companies.

Disruptive? Yes. Fairer? Yes. These are just a few of the ways that the blockchain can be used to reduce inequality by giving control over assets to their rightful owners and by enabling these owners to monetize the assets.¹¹¹

3. Democratic Ownership

The third topic to be addressed in a new social contract and a more democratic economy is restoring a better power balance between owners and shareholders, workers, communities, and other stakeholders, which we've labelled democratic ownership. As outlined in the “disruptions” section, there has been a considerable shift in the balance of power in the economy since the 1980's resulting in considerable asymmetry of economic power. This has contributed directly to greater inequality as economic growth over the last 25+ years has accrued almost entirely to those who already have power and wealth. This is not only happening at the level of the individual firm, but also at the institutional and political level as the voices of wealth and capital, the financial sector and multi-national firms have had a much louder voice at the policy table than small business, labor or communities who may be facing the loss of jobs and opportunity. It also has a negative impact on entrepreneurs and start-ups trying to operate in an economy where the largest firms have a large and growing concentration of data and power.

Based again on the underlying concept of mutual interdependence, we propose a return to a social contract where business is recognized as being an important pillar in a strong economy and a healthy society with responsibilities beyond the bottom line – and to support this direction through practical measures. This includes strengthening of long-standing provisions that have generally been allowed to weaken in the areas of anti-competitive behavior, labor rights, taxation, and consumer protection. In a world of global trade, this means that these principles also need to be enshrined in international agreements and recognized as important underlying concepts supporting the 1948 UN Declaration of Human Rights in a globalized economy.

We will only get there through open discussion and debate on a new social contract with the digital era and a strengthening of our democratic institutions (see more below) which have given big business an inordinate say in policy decisions in recent years. We will only get there through practical measures such as the establishment of countervailing power structures, strengthened institutions and good governance. Rather than a race to the bottom, or even a race to the top, perhaps we need to reshape our thinking as a race to the middle – where the

majority of people live. If we value and strengthen this “middle” through more than lip service, we can attain a stronger and more stable economy that benefits many more people than today. While there isn't much of a specifically “digital” nature to the proposed measures here, increased transparency and accountability from the business sector can be monitored and tracked on-line.

We are not alone in calling for greater business involvement, first in being a part of defining a new social contract as well as being part of innovative solutions. Professors Gittell and Kochan in an article referenced earlier on a new social contract, emphasize the importance of breaking down siloes. We need to strive “to unite stakeholders around a common purpose rather than seeing each individual as one of many competing and mutually exclusive interests.”¹¹² The American Prosperity Project, an initiative of the Aspen Institute has brought together leaders from both industry and organized labor to develop a framework to encourage business to engage in more long-term thinking, including investments in infrastructure, research, education and training, and recommended changes in tax code and laws around corporate governance in a proposed policy framework.¹¹³ In an article about the framework, Paul Polman CEO of Unilever supports the need for looking beyond the quarterly report: “The strategy ends up being focused on the shareholders versus other stakeholders....If ultimately the purpose of a company is maximizing shareholder return, we risk ending up with many decisions that are not in the interest of society.”¹¹⁴

4. Participatory Democracy

As discussed in a previous section, there is a growing cynicism and lack of trust in democratically elected governments to reflect the will of the population and to act in the public interest. This is reflected in declining electoral turn-outs, in highly divisive political debates, in growing grassroots movements to protest decisions of elected leaders or, more positively, to tackle problems on their own. In this section, we propose two main streams of activity in support of the direction of more participatory democracy.

First is the easy to say, but much harder to commit to, implementation of openness, transparency, and accountability of Government (elected) leaders and the public service (non-personal government records and processes). With the aid of digital records and processes, some governments have made huge strides in this area in recent years but there is much more that could be done to increasing transparency. While leaders have learned to be opaque for obvious reasons – especially the challenge of facing intense scrutiny from other politicians and the media – being more transparent can also serve to educate the public and media on the complexity of Government decision-making. When combined with a renewed emphasis on real public consultation, in part through digital media, and other actions to bring about a more informed public, an active public media, and strengthened public discourse (see below), increased openness and transparency can increase public engagement, government accountability and trust.

In addition to more transparency as a means of increasing accountability in and of itself, we propose that smart contracts, enabled by the blockchain, will also be useful. As we wrote about in greater detail in *Blockchain Revolution*¹¹⁵ in greater detail, we propose peer-to-peer networks

to track an elected representative's commitments. This is already done informally on public websites and by media or watchdog groups but could be formalized and automated through a smart contract model, i.e. self-executing agreements which nobody controls and therefore everyone can trust. While it couldn't be applied to everything the elected leader does, it could be used for basic matters such as meeting attendance, voting records, source of political donations as well as to specific commitments and actions. Over time we will build greater sophistication around what's being measured and how to increase understanding, transparency, accountability and trust. A mayoralty candidate in London has already called for the use of the blockchain to hold elected officials accountable. ¹¹⁶

While not the primary reason for including openness and transparency in our list of proposed measures, it should be noted that there are numerous other benefits in making government information accessible in useable form, including providing information that can be put to good use by others to support research, solve problems or create economic opportunity. Both the US and UK governments have taken significant steps in this area with their Open Data initiatives over the past few years. In short, there should be a "bias" towards making information public unless there is a compelling reason not to, and this can be built directly into modern systems so it can be done readily at little incremental cost, if any.

The second stream of activities we propose as part of renewing trust in, commitment to and strengthening of our representative democracies is to change our electoral processes in multiple respects – campaign finance reform, moving away from the "first past the post" (winner take all) model in use in many jurisdictions, and by introducing on-line and mandatory voting.

There are different models of political financing in use across the world all with various advantages and disadvantages. Our main concern is with the virtually unlimited funding by corporations and unions – and the opaqueness of that funding - made possible in the United States through the 2010 Citizens United decision of the Supreme Court. While it is an uphill battle to change the rules around election financing in the US (see some of the arguments in this analysis from the *Atlantic Monthly*¹¹⁷), we strongly support measures to increase transparency of political (including PACs) fund raising, including on line disclosure and inclusion as part of the smart contracts referred to previously. To balance out the influence of the large and wealthy donors, we support measures to encourage donations from all citizens including public matching-type programs and note such programs can be readily facilitated through technology. In recent years, several candidates have demonstrated the potential of raising significant funds through small donations from many donors ("the long tail").

Many argue that the "first past the post/winner take all" system in use in many western democracies including Canada is not representative of the range of the electorate wishes and therefore contributing to apathy and mis-trust. In multi-party elections, it means that much less than 50 percent of the electorate can determine the outcome. Various other models have been proposed including variants of proportional representation or a preferential (ranked) ballot. We support changing the first past the post system so that all voters' wishes are taken into account when counting the ballots.

While we are not a fan of direct democracy, we do develop many ideas in the book *Blockchain Revolution* about ways to involve people more collaboratively in democratic processes through

the blockchain and therefore to build greater engagement and trust and better solutions. In this paper, as a first step, we propose that voting be mandatory and enabled by electronic voting which can be trusted (e.g. integrity, security, privacy) through blockchain processes. “With time and development, blockchain technology might be the impetus that allows e-voting to transform democratic elections and institutions by effectively and reliably bringing them into the voters’ hands.”¹¹⁸

While we recognize that mandatory voting is a major decision to be taken by those jurisdictions that don’t already have it (almost 30 countries have some form of mandatory voting in place including Australia and many Latin American countries). Mandatory voting would put real pressure on the jurisdiction to make voting easy, including the reduction of restrictive measures that may be in place regarding voter eligibility or registration. It would also reinforce the role of voting as a responsibility of citizens as part of a strong democracy, rather than a right, and would tend to increase participation from traditionally disadvantaged groups.¹¹⁹ It would mean that politicians would need to think about and speak to the interests and priorities of all voters during the electoral process even more so than today and it would encourage all eligible voters to think about who best reflects their opinions and who they trust. Rather than opting out for whatever reason (cynicism, perceived lack of knowledge, inconvenience of voting, etc.) we believe mandatory voting would contribute over time to a more informed and active citizenry and political leaders who know they need to respond to that wider base. Further below we discuss other measures to encourage an active and informed citizenry.

5. High-Performance Government

As outlined in previous sections, governments – meaning in this case the non-political bureaucracy at all levels - are caught up in a vicious cycle: there is a decline of trust in government to plan, manage and deliver effective policies and programs which leads to pressure on staff and budgets which further undermines government’s ability to be effective which further undermines trust. In part this is due to large organization inertia and lack of willingness to change; in part it’s due to increased complexity of problems that cross organizational silos; in part it’s due to concerted pressure from the private sector to privatize and open up opportunities to business; in part it’s due to many competing pressures for government attention and resources as well as pressure from all sides to reduce costs and minimize taxes; and in part it’s due to the inability of the public sector to compete for talented staff and retain leadership under these pressures. To some with “the less government the better” philosophy and agenda, this is a good thing as it is a perfect storm to bring about a self-fulfilling prophecy.

We propose that effective government operating in the public interest needs to be fostered as a legitimate and key direction of the new social contract and that action needs to be taken to strengthen government’s capability to plan, manage and implement effective policies and programs (and therefore reinforce that legitimacy). While it may be viewed as an impossible, if not naïve task, we believe that it’s important that the public service (i.e. the bureaucracy) be seen to be operating in the public interest. This includes much greater emphasis on advance consultation, research and evidence-based options and advice and recommendations provided to policy-makers at the elected level. There is lots of scope for elected policy-makers to debate

and determine the overall size and shape of the public service and to establish their priorities and directions through legislation, regulation, and funding, but once those policies are determined they must be implemented and enforced in a fair and objective way in each jurisdiction.

There is a significant opportunity to strengthen the capability and effectiveness of government through information management and digital technologies. This also enables much greater transparency of government (non-personal) information, operations and processes and through that transparency, greater accountability. The process to date has been challenging and slow, but significant progress has already been made by governments all over the world on some of the simpler tasks such as streamlined services, on-line and mobile delivery, and proactive renewals of permits and licences amongst many other matters. This also has laid the foundation for even more significant improvements in the future, in part due to even more technological change including the blockchain and the Internet of Things.

As outlined at length in *Blockchain Revolution*,¹²⁰ these advances enable better planning, management, and measurement of policy and program effectiveness; more proactive services; greater integration of government programs and services across silos and levels of government; true citizen self-service; and better management and security of infrastructure and other improvements. The blockchain can also be applied to new regulatory and enforcement models that simultaneously reduce “red tape” while increasing transparency and compliance. For example, regulators could track the commitments made by regulated industries in real time to assess whether they’re keeping their promises such as investments made in renewable energy, or improved customer service. That improved accountability can be applied to government itself through “smart” social contracts between governments and suppliers or elected officials and citizens (commitments made/commitments met as measured on blockchain-enabled peer-to-peer networks). The blockchain could also be used to ensure the integrity of government transactions and processes such as e-mail records, supply chain management, databases and decision logs. The blockchain protects from tampering from both internal or external sources and therefore keeps “honest people honest.”¹²¹

Interestingly, while research shows a significant decline in overall trust in government, when asked about particular functions or services, trust levels are generally higher, especially when people have availed themselves directly of that service. As Pew Research found in its 2015 survey of trust in government, most Americans have a very low opinion of government overall. “Just 20% say the federal government runs its programs well, and 59% say it is in need of “very major reform...These assessments stand in contrast with the public’s more mixed views of government performance at a specific level. In 10 of 13 areas included in the survey, the balance of opinion about government performance is more positive than negative.”¹²² The lowest ratings in the 2015 survey were in two of the most complex and divisive policy areas: immigration and lifting people out of poverty. At the same time, the same survey shows that the majority of people still **expect** the government to play a major role in these and other matters.

In Canada, surveys of public satisfaction of government services over a number of years have consistently shown that people have a higher opinion of government services when they’ve recently used that service.¹²³ These surveys have also shown that getting the result/service being sought was the key factor in driving satisfaction levels. Although there are a number of

factors that contribute to trust in government, including differing political views, taking care of the basics – ability to deliver services – as strengthened through technology is certainly an important priority to help restore people’s trust in government.

6. Collaborative Institutions

Today many of our institutions and their infrastructures – everything from education, healthcare and science, to electrical power and regulation are based on the industrial model. The industrial age was an age of scale and standardization where powerful forces pushed out products and services to passive recipients. Mass production, mass marketing, mass education, mass media, mass democracy– we pushed out advertisements, television shows, newspapers, products, lectures, medicines, radio broadcasts, electrical power to people who were relatively inert.

Now with the second era of the Internet it is possible to imagine a new set of institutions where this one-way, one-size-fits-all, top down model of institutions is turned on head. It is now possible that teachers, journalists, producers, markets, politicians, doctors and professors can collaborate with users to co-create value. Anthony Williams and I wrote how this is possible in 2010 in *Macrowikinomics*¹²⁴ and today we believe these ideas are valid.

As already suggested in the “Disruptions” section on failing institutions, we support a strong and generally increased role for government in funding education, health, and research and development as part of a new social contract. In each of these cases, a strong case can be made that these functions are essential “infrastructure” for a modern economy and strong and healthy society and therefore there is an important role for the public, as represented by their government, to ensure that infrastructure is in place. For education, we support increased public support for post-secondary education as essential to prepare students to be active participants in the new economy. For health, we support universal health care under a single payer model as the only way to effectively manage the growing costs and risks of an aging population. For research, we support continued public funding of basic research as necessary to support innovation and future economic growth.

For each of these sectors, there are numerous models by which the infrastructure and specific services may be designed and delivered, but government does have a role in setting the direction and policy, defining the “architecture” and ensuring its effective implementation. It also means that this infrastructure needs to be designed to meet the needs of the digital economy.

In addition to the policy and funding role for the government in ensuring strong institutions, there is also a major role for digital technologies to strengthen education, health and R and D both within each sector and through collaboration across sectors. Digital technologies are already transforming how education and health are planned, managed and delivered and how R and D is conducted. They’re giving new tools to educators and students, care givers and patients, researchers and developers across sectors and geographies.

This paper is too short to provide many examples here, but trends and possibilities enabled by digital technologies we find particularly exciting are the ‘flipped classroom’ model where students review course content on-line, collaborate with others on-line and in the classroom,

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and participate in active learning and conceptual thinking under the guidance of a teacher/mentor in the classroom. Virtual reality will provide opportunities for training in many fields in highly realistic settings. Of course, technology is already being used extensively for distance education and on-line learning from anywhere at any time.

Remote medicine or telehealth is now widespread including remote diagnoses and monitoring. The long-awaited electronic health record, with appropriate privacy protection, will bring both systemic benefits (e.g. through better information management and analytics to guide planning and resource allocation) and benefits to the individual patient (e.g. enhanced case management and reduction in duplicate testing). In addition, new technologies are now being used for chronic disease monitoring and management and 'aging in place'. In general, digital technologies can enable individuals to take a much more active role, even control, of their own educational and health needs.

Researchers were the very first to take to the Internet and to use it to collaborate with others across institutions and across geographies and they've contributed to, and benefitted from, advances in digital technologies every step of the way. Now in the fourth industrial revolution, Brian David Johnson, a futurist at Frost & Sullivan Research, suggests "Our thinking is limited, innovation isn't...To go from digital technology to biology and back. It's so new we can't even imagine what we could do."¹²⁵

Finally, as we've written about extensively in the past, we believe there is a significant role for multi-stakeholder global solution networks to bring together people from across multiple fields, multiple sectors and multiple geographies to tackle some of the more complex challenges of our day.

A 'Global Solution Network' (or GSN) is a group of independent parties who have been brought together by a world problem they all perceive to be important, and which no single group has the ability to handle on its own. They become a network when they begin communicating about and coordinating their activities to make progress, rather than working independently and competitively (as an 'industry' in a market economy).¹²⁶

Several such networks already exist for purposes of knowledge sharing (e.g. Wikipedia), advocacy (e.g. Avaaz.org), performing a watchdog role (e.g. Human Rights Watch), developing policies or standards (e.g. International Competition Network, Internet Society), governance (e.g. Internet Corporation for Assigned Names and Numbers ICANN), operational (e.g. Crisis Commons), providing a platform (e.g. Ushahidi) or several of these roles (e.g. World Economic Forum).¹²⁷ Enabled by digital technologies, GSNs cut across traditional institutional lines and bring together the knowledge, experience and ideas of many individuals and organizations at the community, regional, national and international levels to collaborate on options and solutions. Businesses are often involved as important contributors of both ideas and solutions and governments also bring information, ideas, and often play an important implementation role. These networks also engage and strengthen civil society at both the institutional and individual participant level, i.e. GSNs engage all four pillars in the new social contract all of whom are stakeholders in a successful collaboration and outcome.

7. An Informed Society

In this section, we look at three broad and related approaches to contribute to a more informed society on both the “supply” and “demand” side of the equation: measures designed to continue to increase access and participation on the WWW; measures designed to improve the transparency of information, ideas, and tools that are part of informing our public policy discourse; and measures designed to improve the capability of the population overall for critical thinking. While there will continue to be a massive amount of digitized information available through multiple channels from multiple sources, there are still many who are not part of the digital world. As we said in an earlier section, that needs to change. We also need to have greater transparency and accountability regarding the source and reliability of information on the WWW as well the tools, including algorithms, being used to manage that information and influence opinions and behavior. We need to resource and maintain a strong presence for the “fourth estate” as well as for researchers and scientists to help inform the public discussion. While in the previous section we identified the importance of education to employment, economic growth and social cohesion, in this section, we focus on one aspect of that education, i.e. stronger foundations in civics and critical analysis.

The World Wide Web Foundation, established by Sir Tim Berners-Lee the inventor of the WWW, has a five-year strategy initiative aimed at ‘delivering digital equality’ because of its belief that the web is heading down a path towards greater inequality:

We must act now to close the divide between digital haves and have-nots or we risk losing the web’s potential to serve humanity forever. To do this, we must work harder to ensure that everyone has the access, skills, and freedoms to appropriate and control new technologies for their own benefit. We must also make sure that control of the web is not held by a few governments or companies.¹²⁸

To this end, the Foundation has identified initiatives in three related areas which we support, namely ensuring that people’s voices can be heard equally (‘power’), holding governments and corporations to account (‘accountability’), and closing gaps in access and affordability to the economic and social opportunities of the digital world especially for women and other excluded groups (‘opportunity’). Numerous important priorities are identified including affordable broadband, strong protections around net neutrality, encouraging diversity of voices on-line, and rules against on-line harassment and intimidation. There are two topics included in the Foundation’s plans we want to focus on here, namely, rules against on-line surveillance and much greater transparency and accountability regarding digital information on-line as well as how it’s managed and used, (e.g. search engines, algorithms).

‘The internet is among the few things that humans have built that they don’t understand.’ It is ‘the largest experiment involving anarchy in history. Hundreds of millions of people are, each minute, creating and consuming an untold amount of digital content in an online world that is not truly bound by terrestrial laws.’ The internet as a lawless anarchic state? A massive human experiment with no checks and balances and untold potential consequences? What kind of digital doom-monger would say such a

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thing? Step forward, Eric Schmidt – Google’s chairman. They are the first lines of the book, The New Digital Age, that he wrote with Jared Cohen.¹²⁹

Far from calling for a reduction of information available on-line, we first call for even more information – from traditionally excluded groups, from researchers and scientists, and from trained and professional journalists so these voices can form a part of the discussion as it increasingly moves to the digital world. Nor are we calling for content regulation – beyond the application and enforcement of general laws which already exist related to such matters as defamation, fraud or hate speech – that would be a losing battle in any case. Instead, we support increased transparency on-line re the source of digital content, how search engines are designed, how information is disseminated, and the development of tools to help identify false information, hate speech and bullying, or other anti-social behaviors on-line. Models for self-governance of social media sites should also be studied and explored, including enforceable codes of conduct.

It is all happening very quickly. Today’s on-line environment has been called an “information war” by Jonathan Albright of Elon University in North Carolina who has recently published his research on how “fake news” is being quickly and widely disseminated.

They’re sending out thousands of links to other sites and together this has created a vast satellite system of rightwing news and propaganda that has completely surrounded the mainstream media system....it’s surrounding and actually choking the mainstream news ecosystem.. .Like an organism that is growing and getting stronger all the time.¹³⁰

Digital technologies and increased public awareness can be used to help us understand, navigate and use the vast and growing amounts of digital information more knowledgeably, including being more aware of the risks.

There must also be strong laws and protections against digital surveillance, whether by private corporations or the government. As we live our lives increasingly on-line, it is now possible to create a digital identity for each of us that contains all manner of information about our likes, dislikes, opinions, and behaviors in the past, present and even predictions for the future. It’s not just the surveillance that may be problematic; it’s what is done with the information gathered through the surveillance, including the use of powerful new tools to influence our behavior and opinion that we may not even be aware of. While surveillance is a very complex and sensitive topic, it is already underway to some degree using the information we’ve often willingly provided.

The topic of Government surveillance has been a high profile topic for public discussion in the United States for a number of years, especially since the Edward Snowden leaks of 2013. Discussion of surveillance by private corporations has generally been more limited and many people are likely unaware of the degree to which it’s already happening. It’s long past due that we have a wide and open discussion of what should be allowed and not allowed when it comes to surveillance on-line and how those rules should be enforced. We will talk further about our digital identity and the importance of personal privacy in the next section. In this section, we highlight the risks of digital surveillance especially as it relates to our rights as citizens. As

eloquently written about by Glenn Greenwald in his book *No Place to Hide*,¹³¹ our ability to hold opinions in private, is one of the fundamental underpinnings of our western democracies.

In her article for the *Guardian* newspaper¹³², Carole Cardwalladr writes of the tremendous dominance and influence Google and Facebook now have based on the massive amounts of data they have collected and stored by tracking the on-line behavior of their billions of users. While there are perhaps many benefits flowing from this (e.g. location-specific options and shopping convenience), there are also many risks, especially if we don't know what information they have, how it's being managed, and how it's being used, including the use by third-parties. We believe there needs to be much more transparency on all these elements and a code of ethics developed and applied.

In an earlier section on "rethinking work" we identified the need for a code of ethics in the area of Artificial Intelligence (AI) to ensure that we understand underlying assumptions in information processing and that there is transparency, fairness and incorruptibility amongst other factors.¹³³ In that section we were concerned about applications such as assessing job applicants or health assessments; in this section we're concerned about the very underpinnings of a functioning democracy – the information and knowledge upon which we base our opinions and public discourse. If search engines have unknown and built-in biases, if we're being sent only information and ideas to validate our already known positions, and if each of us is receiving very different messages from the same political candidate, where is there a basis for a shared understanding of the facts and informed discussion of the issues and options?¹³⁴ We collectively became more aware of the existence of these processes, including the risks associated with unknown algorithms being designed by anonymous people, during the recent US election and UK Brexit campaigns and some work has begun to make the processes and algorithms more transparent. Much more needs to be done.

Finally, in this section it is important to highlight the important role of researchers, scientists and professional journalists as well as the need to strengthen education at all levels in basic civics and critical analysis and judgement. These are also key to maintaining and enhancing our capability for an informed society. In addition to ensuring their voices are present on-line, we need to continue to ensure adequate funding for scientists and researchers as they not only contribute information, analyses, and an informed perspective on the important issues of today, but they may also have a longer-term perspective and be able to guide and warn us about important issues of tomorrow. The scientific method and peer-to-peer review processes of the scientific community are critical and help differentiate a scientist's opinion from others on the WWW.

Similarly, whereas we used to rely upon journalists to sort through all the available information and guide us in our analysis through their investigative reporting, editorial, and curatorial roles, they too are overwhelmed and their reports may be buried on the web as we saw above. Some traditional media outlets have and are adapting well to a hybrid paper and digital world by adopting all the digital tools, including video and social media and other professional news sites have emerged solely in the digital space. We need to value and support the role of these journalists in adding depth, analysis and meaning. In Canada, the UK and Europe there are also publicly funded news outlets that operate independently from the Government. Because they're not driven solely by 'the bottom line', these news media can cover regional stories,

emerging stories, or assign investigative reporters that may not be within the budget of private media. This is important and should continue.

In addition to increased transparency and public awareness of information and processes on-line, and in the context of “the information war”, we also need to increase peoples’ capability to find relevant and reliable information on the WWW and to be able to assess the validity of what they receive. In the world of massive amounts of instantly available information, communication by text and tweet, and 24-hour news on television and on-line, we all need to apply critical thinking skills to the information we receive and to further develop our analytical skills and media literacy. This should be done as part of the core curriculum at all levels in a “learn by doing” manner as well as specific topics to be developed as part of the civics curriculum.

8. The Digital Age Identity

As outlined in an earlier section, there are large and growing challenges to the autonomy and privacy of the individual including data tracking of every activity we undertake with a digital “foot print”, growing commercial data bases of that information, and data analysis using algorithms that we know little about that are designed to understand, predict and influence our future behavior. Identity theft is a major concern as is loss of privacy. The data, often – but not always - freely and knowingly provided is being used to provide us with personalized advertising, products and services and to influence our behavior. It can – and is – being used to influence opinions by directly targeting individuals with specific information and messages, including during elections. It potentially could be accessed by government agencies (police, security, tax, other) to conduct surveillance operations when authorized for specific purposes. It also means that others are earning revenue from this information, rather than you, the originator of that information.

Not surprisingly given the inter-relationship of both concepts as part of a functioning democracy, there is considerable overlap in what we need to do to create an informed society and what we need to do to support a digital-age identity. In the previous section on creating an Informed Society, we noted that there must be strong laws and protections against digital surveillance, whether by private corporations or the government. We also called for much more transparency and a code of ethics on what data is collected, how it is processed, and how it is used. We noted that models for self-governance of social media sites should also be studied and explored, including enforceable codes of conduct.

In this section, focusing on personal privacy and security, we go further by stating the principle that people should control their own data. As I’ve previously written, “people ought to have the right to decide what, when, how, and how much about their identities to share with anybody else.”¹³⁵ Let’s choose ‘privacy by design’ as former Ontario Privacy Commissioner Ann Cavoukian likes to say. This can be done by embedding privacy and security into data architecture and through the blockchain. “The blockchain protocols allow us to choose the level of privacy we’re comfortable with in any given transaction or environment. It helps us to better manage our identities and our interaction with the world.”¹³⁶ We therefore support the work already

underway to establish individual identity in a 'black box' enabled by the blockchain.¹³⁷ Each individual will be able to define his or her own parameters through a portable personal avatar which they own and control and which will follow them around and implement their choices on which data to share, with whom, and at what price, if any. In addition to deciding the level of privacy, this approach therefore enables the individual to earn money from their own data should they so choose. From 'big data' to 'private data', or as we've called it in the *Blockchain Revolution*: little data.

An alternative approach but with similar intent – re-decentralization of the web - comes from Sir Tim Berners-Lee with his "Solid" (social linked data) initiative. "With Solid, you store your data in "pods" (personal online data stores) that are hosted wherever you would like. But Solid isn't just a storage system: It lets other applications ask for data. If Solid authenticates the apps and — importantly — if you've given permission for them to access that data, Solid delivers it."¹³⁸

It is not possible to have privacy without security. Maintaining secure systems at the individual, firm, organization, government and network level will require constant vigilance and constant improvement. One step already well underway is the adoption of the encrypted version of the web's HTTP protocol, i.e. the move to HTTPS.¹³⁹ The blockchain also has built-in security.

9. A Resilient Biosphere

There are two broad areas in which digital technologies can contribute to a more resilient biosphere: by becoming more energy efficient within the sector itself, and by helping other sectors become more sustainable. While the former is important, the latter holds even greater promise.

Many of the largest consumers of energy within the digital economy have committed to a zero-carbon footprint through conversion to entirely renewable energy sources. Google for example, which in 2015 consumed as much energy as the entire city of San Francisco,¹⁴⁰ announced in December 2016 "that in 2017 Google will reach 100% renewable energy for our global operations — including both our data centers and offices. To reach this goal we'll be directly buying enough wind and solar electricity annually to account for every unit of electricity our operations consume, globally."¹⁴¹ In his announcement, Urs Hölzle, a senior vice president at Google emphasized two things – that renewable energy sources are increasingly the lower cost option, and that Google's purchases are enabling further investment in renewable power helping to drive down costs for everyone and therefore further reductions in CO2.

Other digital companies are also increasingly using renewable energy including Apple, Facebook, Amazon and Microsoft.¹⁴² Apple has achieved 100% renewable energy for its data centers.¹⁴³ Apple is using wind energy to power its two new data centers in Ireland and Denmark, with solar power planned for a data center in North Carolina, while Facebook is doing the same for its data centers in Ireland and Sweden.¹⁴⁴ Amazon Web Services (AWS) has committed to using renewable energy for 100% of its power needs and expects to reach the 50% level by the end of 2017.¹⁴⁵

The use of renewable energy is in addition to other measures to reduce energy consumption generally, including a 50% increase in the energy efficiency of Google's data centers due in part to the use of machine learning algorithms to analyze and increase data center efficiency. "Facebook's role is also particularly notable.... in 2011, through its Open Compute Project, or OCP, Facebook open-sourced many of its streamlined data center designs, sharing them with the world at large. This has sparked a dramatic shift in the way the industry builds hardware."¹⁴⁶

Because it makes both economic and environmental sense, it is expected that the trends by digital companies towards increasing energy efficiency, especially in data centers, and the use of renewable energy sources will continue. This is especially important because there is expected to be more use of digital technologies in general across most sectors, including many applications which will have a positive environmental impact.

The energy sector is achieving increased energy efficiency in addition to cost-effectiveness and reliability through the implementation of the 'smart grid' including smart meters.¹⁴⁷ A group of US scientists have calculated that the implementation of a smart grid leads to a reduction in electricity consumption and CO2 emissions within the sector itself through such factors as better diagnostics and improved consumer information and feedback.¹⁴⁸

Transportation consumes almost 30 percent of energy used in the US,¹⁴⁹ while residential and commercial buildings also represent approximately 30 percent of energy consumption in the US (excluding computer usage inside the building (~10 percent)).¹⁵⁰ There is significant potential for greater energy efficiency in building management, including heating, cooling, lighting, water heating and other functions as all become connected to the Internet of Things (IoT). In addition to other benefits, the IoT enables remote monitoring and 'just in time' usage meaning that energy-consumption can be managed more efficiently overall and/or timed to take advantage of variable pricing.¹⁵¹

*'I'm pretty confident that the Internet of Things is going to have net negative power consumption,' Hölzle [of Google] said during a briefing with reporters on Tuesday. 'If you control lights, heat, and cooling in smarter ways, that's really substantial.' Even self-driving cars, he says, will push us towards lower power consumption. 'You'll have fewer cars on the road, fewer parking lots, less congestion, because every car is a potential carpool.'*¹⁵²

Other IoT and digital technology-enabled energy efficiency measures in the transportation sector include improved fleet management, remote diagnostics, improved traffic signalling to reduce congestion and wasted energy, and the use of mobile technologies to reduce the need for office space and unnecessary commuting. Of course, cost and energy savings are being achieved across all sectors through video and audio teleconferencing as a substitute for expensive and energy-intensive travel. Undoubtedly there is even more energy-savings potential through teleconferencing in the future.

The emerging blockchain offers several new opportunities for increased energy efficiency across various sectors. In *Blockchain Revolution*¹⁵³ we identified several such opportunities including the establishment of blockchain-enabled mesh networks which will enable, for example,

farmers, home-owners, and others with excess power derived from renewable sources to sell that power to others who are participating on the neighborhood microgrid. The opportunity to earn revenue from a solar or wind power investment will provide a further incentive to invest in renewable energies and to reduce reliance on CO₂. It will also reduce energy loss by reducing the need for long-distance transmission. Work is already well advanced on this opportunity including a model project in Brooklyn New York.¹⁵⁴

Blockchain-enabled technology can enable more efficient uses of resources across many sectors, for example in property management where vacant office space or meeting rooms can be identified through digital sensors and people seeking space can locate, use and pay for the space entirely through an automated system. Just-in-time production in the manufacturing sector can result in even fewer delays and less wastage of scarce resources.

Another blockchain-enabled opportunity with significant positive environmental impact is the potential to implement a CO₂ cap and trade system at the regional, national or international level.¹⁵⁵ Such a network would provide a transparent and incorruptible means of recording carbon emissions and sequestrations and associated transactions. When combined with IoT, or other means of verification, it would be a powerful mechanism to support a cap and trade system to drive reduced emissions. There's even the potential to create a workable cap and trade model for individual people. That would certainly change behavior and could even create new sources of revenue for people, including the poor since they are undoubtedly low carbon users.

These are just a few of the ways in which the blockchain, combined with the IoT can support the achievement of a resilient biosphere. To paraphrase what we've already written in the book on the blockchain, anywhere where blockchain-enabled devices (e.g. sensors) can be used to sense (e.g. falling temperature, broken pipeline, traffic jam, energy usage) and respond (e.g. turn on the heat, send the repair crew, change the traffic light cycle, price and provide feedback) holds the potential to conserve energy amongst other benefits.

The Time is Now

The challenges are huge; the need is urgent; current trends are not sustainable. There are far too many people being excluded from the global economy; too many people living on the margins at extreme risk and with no hope for the future; too many regions suffering from the loss of industrial jobs with no jobs in site to replace them; global temperatures are at an all time high with increasing numbers of weather emergencies; and too many governments and other institutions we look to for leadership moving too slowly if at all to address these challenges. We have lost confidence in our leaders and the democratic process and lost interest in, and perhaps the capability for, a respectful public discourse based on objective information on the challenges and possible solutions. There is no consensus on the best path forward with strongly held and competing views.

In part, due to political events in Europe and the U.S. over the past year or so, but also due to longer term underlying trends, there is now a burning platform for change. More and more people are

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saying that we must get at the root of our current economic problems by revisiting the “social contract” that has been assumed – but not practiced – for so many years. Or, as McKinsey has called it “a new societal deal”.¹⁵⁶ Let’s have a conversation about what really matters to us in our communities, our countries and globally and what we need to do to build stronger and more inclusive economies and societies. Let’s participate in multi-party community, national, and “global solution networks” to discuss the underlying directions of a new social contract more appropriate to the digital economy and to develop innovative solutions to complex challenges based on these principles. The mood is right, the time is now, for leaders and activists in every jurisdiction to initiate these solution networks.

In this paper, we’ve suggested what we believe should be the new directions as well as many specific solutions. In many cases, these directions and solutions represent a dramatic change from past practices. This is necessary and appropriate in that past approaches are clearly no longer working. Radical new models are possible now with the knowledge and tools of the digital economy. People everywhere are becoming smarter together, scrutinizing institutions, organizing collectively and forging alternative ways of doing almost everything. We need to value the individual – all individuals – and give everyone the opportunity to participate fairly in the digital economy. Businesses need to recognize they can’t succeed in a world that’s failing. Teachers, scientists, researchers and the fourth estate need to ensure our children grow up skilled in analytical thinking and that our deliberations and decisions are evidence-based. Democracy in the digital age must be based on a culture of transparency, accountability, participation and active citizenship. We need high-performance governments and Government leaders who are not afraid to adopt new and sometimes controversial paths and to lead the transformation we so desperately require.

There won’t be one answer; there won’t be one solution. But if we can start the conversation and begin to test new models, it will give us a path forward. The time for action is NOW.

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¹⁰⁸ For example, Canada’s regulator, the Canadian Radio-television and Telecommunications Commission (CRTC) released its latest broadband policy – including funding to reach underserved areas – in December 2016. <http://www.crtc.gc.ca/eng/publications/reports/rp161221/rp161221.htm>

¹⁰⁹ Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World by Don Tapscott and Alex Tapscott, Penguin Canada 2016

¹¹⁰

https://www.ted.com/talks/don_tapscott_how_the_blockchain_is_changing_money_and_business/transcript?language=en by Don Tapscott, August 2016

¹¹¹ **Note to Don** – the ability of individuals to monetize everything seems to be contradictory to another model out there which uses IP and other “assets” being used by the private sector as the rationale for pooling (i.e. the opposite of distributing) resources, i.e. by forcing companies to pay into a portable safety net or UBI for example; they’re benefitting from things that should really be considered a public good, paid for by years of investment in education, research, individual employee ingenuity, etc. Need to acknowledge and reconcile these two models and consider whether they can co-exist or which is the preferred path forward. This note to be replaced; simply a **flag/reminder**.

¹¹² “A New Social Contract: To tackle inequality, businesses, workers, and the public sector need to come together.”

by Jody Hoffer Gittel and Thomas Kochan, Stanford University, August 3, 2016

<http://stanfordpress.typepad.com/blog/2016/08/a-new-social-contract.html>

¹¹³ <https://www.aspeninstitute.org/publications/the-american-prosperity-project-policy-framework/> December 19, 2016.

¹¹⁴ “How to Stop Short-Term Thinking at America’s Companies: U.S. companies are hyper-focused on quarterly earnings. What can be done to push them to invest more in the years and decades ahead?” by Alana Semuels, The Atlantic, December 30, 2016

<https://www.theatlantic.com/business/archive/2016/12/short-term-thinking/511874/>

¹¹⁵ Blockchain Revolution. Don Tapscott and Alex Tapscott, 2016, see especially Chapter 8.

¹¹⁶ London Mayoral Candidate George Galloway Calls for City Government to use Block Chain for Public Accountability. Elliot Maras, Bitcoin News, July 2, 2015 <https://www.cryptocoinsnews.com/london-mayoral-candidate-george-galloway-calls-city-government-use-block-chain-public-accountability/>

¹¹⁷ “How Can the U.S. Shrink the Influence of Money in Politics? Campaign finance is at the very heart of complaints about elections. Let’s look at some of the claims about money’s role, and proposals to change it.” By Russell Berman, Atlantic Monthly, March 16, 2016.

<https://www.theatlantic.com/politics/archive/2016/03/fix-money-in-politics/473214/>

¹¹⁸ Blockchain Revolution Don Tapscott and Alex Tapscott, Penguin Canada, 2016 p 217

¹¹⁹ “Beyond Turnout: The Consequences of Compulsory Voting”, Shane P Singh, published in Political Insight, <https://www.psa.ac.uk/insight-plus/beyond-turnout-consequences-compulsory-voting>

¹²⁰ Blockchain Revolution Don and Alex Tapscott, 2016 especially chapter 8 “Rebuilding Government and Democracy” <http://blockchain-revolution.com/>

¹²¹ Can You ‘Snowden-Proof’ The NSA?: How The Technology Behind The Digital Currency — Bitcoin — Could Stop The Next Edward Snowden, by R C Porter, Fortuna’s Corner, June 3, 2015,

<http://fortunascorner.com/2015/06/03/can-you-snowden-proof-the-nsa-how-the-technology-behind-the-digital-currency-bitcoin-could-stop-the-next-edward-snowden/>

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- ¹²³ Citizens First Research Series, Institute for Citizen-Centred Service (Canada) <https://iccs-isac.org/>
- ¹²⁴ Macrowikinomics: New Solutions for a Connected Planet by Anthony D. Williams and Don Tapscott, 2010
- ¹²⁵ As quoted by Orla O’Sullivan, “How can the US regain its mojo on R&D?” *ibid*.
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- ¹²⁸ Delivering Digital Equality: The Web Foundation’s 2017-2022 Strategy, <http://webfoundation.org/2017/02/delivering-digital-equality-the-web-foundations-2017-2022-strategy/>
- ¹²⁹ “Google, democracy and the truth about internet search” Carole Cadwalladr, The Guardian, December 4, 2016 <https://www.theguardian.com/technology/2016/dec/04/google-democracy-truth-internet-search-facebook> She was writing about The New Digital Age by Eric Schmidt and Jared Cohen, 2013
- ¹³⁰ Jonathan Adler as reported by Carole Cadwalladr in the Guardian, *ibid*. Here is link to Prof. Adler’s research. <https://medium.com/@d1gi/the-election2016-micro-propaganda-machine-383449cc1fba#.wydmbce8e>
- ¹³¹ No Place to Hide Glenn Greenwald, 2014
- ¹³² *ibid*
- ¹³³ “Code-Dependent: Pros and Cons of the Algorithm Age”, February 8, 2017, Pew Research. This paper contains considerable analysis of the use of algorithms across many functions, including numerous examples with negative consequences and the various mechanisms in place and proposed to ensure their validity. <http://www.pewinternet.org/2017/02/08/code-dependent-pros-and-cons-of-the-algorithm-age/>
- ¹³⁴ According to Carole Cadwalladr writing in the Guardian (*ibid*) there were 40-50,000 different targeted “ads” e-mailed directly to voters every day based on their personal profiles in the recent US election. “They were using 40-50,000 different variants of ad every day that were continuously measuring responses and then adapting and evolving based on that response,” says Martin Moore of Kings College.
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- ¹⁵⁰ Center for Climate and Energy Solutions <https://www.c2es.org/technology/overview/buildings>
- ¹⁵¹ <http://www.govtech.com/fs/news/The-Internet-of-Things-Will-Thrive-On-Energy-Efficiency-.html> (can probably find a better reference with statistics; this will do as a placeholder for now)
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