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"Tech:" The Curse and The Cure: Why and How Silicon Valley Should Support Economic Security

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Silicon Valley has become a looking glass into a possible tech-centric future. Some aspects are innovative and inspiring—watching cars drive themselves—while others seem rather dystopian—walking in curves to avoid the bodies of the majority Bay Area native[1] homeless in downtown San Francisco. This Article first examines the "curse," the traceable relationship between the Bay Area's rapid innovation and the gentrification and helplessness that permeate it. The impact of economic growth in the tech sector on poverty and wealth inequality is explored in the frames of automation, innovation, and infrastructure. The latter part of this Article explores "cures," starting with corporate philanthropy and ending with alternatives to the current tech infrastructure. What if the beneficiaries of technology could recognize their impact and address it directly? What if tech capital could be accessible to all? This section introduces a theoretical policy initiative inspired by universal basic income.

INTRODUCTION – *ARE THEY DEAD?*

I am biking in the dark after disembarking Caltrain.[2] It is the last half mile in my weekly commute between Palo Alto and San Francisco. The air wafts urine so frequently in my neighborhood that I do not notice it anymore unless it smells sickly.[3] As one local elected official complained, "[T]here's the smell, the dirt. The needles, the human waste, the garbage."[4] The problems are so extreme that former District 8 Supervisor compared Powell Station, located centrally in downtown San Francisco, to a homeless shelter, where homeless people are "sprawled all over the place, sometimes shooting up, sometimes with clothes not completely covering their backsides."[5]

In fact, San Francisco's Public Works Director, Mohammed Nuru, who is "responsible for cleaning up encampments, discarded needles, and human feces," told reporters that he is "growing impatient."[6] He said, "We feel like we're a maid

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1. San Francisco's 2017 Homeless survey found that 69% of S.F. homeless were living in San Francisco at the time they became homeless, with 55% of those having lived in San Francisco for over ten years and 8% under one year. 21% became homeless while living in a different CA County. APPLIED SURVEY RESEARCH, 2017 SAN FRANCISCO HOMELESS COUNT & SURVEY COMPREHENSIVE REPORT 22 (2017), hsh.sfgov.org/wp-content/uploads/2017/06/2017-SF-Point-in-Time-Count-General-FINAL-6.21.17.pdf [https://perma.cc/2VAM-RKRP].

2. "Caltrain provides commuter rail [transportation] service along the San Francisco Peninsula, through the South Bay to San Jose and Gilroy." *About Caltrain*, CALTRAIN, http://www.caltrain.com/about.html [https://perma.cc/PMJ7-XZW5] (last updated Mar. 2, 2017).

3. Beth Spotswood, *2017 San Francisco 'Homeless Census' Reveals That Despite Numbers, Things Are Worse, Not Better*, SFIST (June 26, 2017), http://sfist.com/2017/06/26/2017_san_francisco_homeless_census.php [https://perma.cc/TVN8-PP25] (pointing to the complaints filed regarding human waste).

4. *Id.*

5. *Id.*

6. *Id.*

service."[7] His frustration is understandable. Nuru shared, "We clean, we come back. We clean, we come back."[8] To him and other local officials, "[t]he real question is, 'Are we getting anywhere?' We don't want to just continue going around in circles."[9]

In the United States, the law has consistently shown lack of consideration for the poor. Nearly fifty years ago, the United States Supreme Court held that claims brought by poor Americans should be evaluated under the lowest level of scrutiny, "rational basis."[10] At the state level, such interpretations of the law have been unduly harsh. In *Chavis v. Lyng*, the plaintiff sought special meals from the shelter (required by his medical condition).[11] Frequently, the shelter ran out of food and could not meet the needs of the homeless man.[12] The case involved the withholding of food from a starving, homeless man, barred from receiving food stamps because he slept in a government-funded shelter.[13] Eventually, after various hospitalizations, he, suffering from renal failure, malnutrition, and dehydration, starved to death.[14]

The Court has insisted that the Constitution does not expressly confer any rights of material subsistence and thus commands no "special judicial protection" for the poor.[15] In such instances, the Court defers to the legislature, arguing that the democratic process should take its course. In other words, if voters want to provide for the needs of the homeless, they will elect individuals who enact laws to protect and serve the homeless. As Professor Stephen Loffredo wrote in an often-cited article,

> [B]y justifying its poverty cases in this manner, the Court places considerable weight on a bare assumption that poor people have fair access to the political process. Yet the Court has never paused to consider

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7.   *Id.*

8.   *Id.*

9.   *Id.*

10.   San Antonio Sch. Dist. v. Rodriguez, 411 U.S. 1, 17 (1973) ("We must decide, first, whether the Texas system of financing public education operates to the disadvantage of some suspect class or impinges upon a fundamental right explicitly or implicitly protected by the Constitution, thereby requiring strict judicial scrutiny. If so, the judgment of the District Court should be affirmed. If not, the Texas scheme must still be examined to determine whether it rationally furthers some legitimate, articulated state purpose and therefore does not constitute an invidious discrimination in violation of the Equal Protection Clause of the Fourteenth Amendment."); *see, e.g.*, Dandridge v. Williams, 397 U.S. 471, 487–88 (1970) ("We do not decide today that the Maryland regulation is wise, that it best fulfills the relevant social and economic objectives that Maryland might ideally espouse, or that a more just and humane system could not be devised. Conflicting claims of morality and intelligence are raised by opponents and proponents of almost every measure, certainly including the one before us. But the intractable economic, social, and even philosophical problems presented by public welfare assistance programs are not the business of this Court."); *see also* Chavis v. Lyng, No. 87 Civ. 1500 (S.D.N.Y. Mar. 5, 1987) (unreported decision).

11.   *Id.*

12.   *Id.*

13.   *Id.*

14.   *Id.*

15.   *Id.*; *see also* Stephen Loffredo, *Poverty, Democracy, and Constitutional Law*, 141 U. PA. L. REV. 1277, 1278 (1993).

whether the political process is in fact "democratic" with respect to the poor. [16]

It is hard to fathom that San Francisco is such a wealthy city; when I passed by the same tent homes every night, I saw chittering crowds awaiting admittance to the Multi-Service Center South,[17] San Francisco's largest homeless shelter.[18] Homelessness is so dire in San Francisco that more than six dozen competing media organizations joined together to address it.[19] According to the San Francisco Chronicle, "In many ways, that initial effort was an incredible success."[20] The collaborating media organizations "held politicians accountable for promises, and [they] raised issues that had seldom been discussed. The unorthodox collaboration inspired similar days of news coverage around the country, won some awards, and has been credited with inspiring tens of millions of dollars in private philanthropic donations."[21] Sadly, in 2018, editor in chief of the San Francisco Chronicle, Audrey Cooper, reported, "[T]he crisis remains."[22]

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16.   *Id.*

17.   Multi-Service Center South describes itself as "San Francisco's Largest and Most Extensive Homeless Shelter." It asks visitors to its website to "[i]magine living your life without knowing when you'll be able to take a shower, whether you're going to be able to eat that day, or where you're going to sleep that night. Sadly, this is the reality for nearly 7,500 people in San Francisco." *See MSC-South*, St. Vincent DePaul Soc'y S.F., https://svdp-sf.org/what-we-do/msc-shelter/ [https://perma.cc/6GDX-ZJHA] (last visited June 16, 2019).

18.   Homelessness is so severe that, in 2016, "[t]he San Francisco Chronicle and more than 80 other media outlets joined together to form the S.F. Homeless Project. As competitors, we agreed that on a single summer day we would flood airwaves, the internet and print publications with news about the solutions to and causes of homelessness. We would make it so that on at least one day nobody could ignore the problem or its potential cures." Audrey Cooper, *2018 SF Homeless Project: What's Done, What's Left to Do*, S.F. Chron. (June 24, 2018), https://www.sfchronicle.com/news/article/SF-Homeless-Project-What-has-been-done-and-13017681.php [https://perma.cc/SR46-QCHF].

19.   *Id.*

20.   *Id.*

21.   *Id.*

22.   *Id.*

Figure 1: Apartment Entrance, SOMA, SF. Man Sleeping by Vomit, November 13, 2017

Every two years since 2005, San Francisco has conducted a homelessness census.[23] It is officially named the "Homeless Point-In-Time Count and Survey."[24] The nearly eighty-page census report notes that in 2017, despite a 0.5% drop in homelessness, there were still seventy-five hundred homeless including over thirteen hundred unaccompanied homeless youth.[25] Experts believe the drop in

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23.   Spotswood, *supra* note 3.
24.   *Id.*
25.   *Id.*

homelessness is due to families moving off the streets together. Nonetheless, the number of individual adults, the most visible members of the homeless community, has increased.[26]

In San Francisco, homelessness is hard to avoid. Sometimes I would return to my shared apartment and find a figure outside my door, asleep with no blanket. Once, I found a couple with a small pile of belongings, including a stuffed animal. Once, a glowing tent. Once, a man chased me down the street, only stopping when I reached his scattered goods. Key in hand to open my door, we held eye contact. He nodded at me and walked back to his lookout. I do not know which of us had been more frightened. Yet, this reality coexists with another truth; two blocks north of my former home—an "affordable"[27] divided townhouse exceeding $6,000 per month for four converted bedrooms, one shared bathroom, and no common areas—stands downtown San Francisco, one of the world's most famous cities. Its downtown area bristles with tourists, tech workers, famous software companies, elite boutiques, and, sadly, people lacking homes. I would see people flat on the sidewalk and wonder, *"What should I do? How long will they rest here if they're dead?"* That was before the bodies just became a backdrop—with repetition, I found that I had to remind myself to care.

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26. *Id.*

27. A New York Times report explains that "[t]he federal government pegs the 'fair market rent' for a two-bedroom in the San Francisco area at $3,121." Karen Zraick, *San Francisco Is So Expensive, You Can Make Six Figures and Still Be 'Low Income'*, N.Y. TIMES (June 30, 2018), https://www.nytimes.com/2018/06/30/us/bay-area-housing-market.html [https://perma.cc/44M4-WA DZ]; *see also* Adam Brinklow, *San Francisco's Medial House Price Climbs to $1.61 Million*, CURBED (Apr. 5, 2018), https://sf.curbed.com/2018/4/5/17201888/san-francisco-median-home-house-price-average-2018 [https://perma.cc/M8KX-NAV2] (reporting that, in the past five years, median housing has nearly doubled).

Figure 2: *Outside Apartment SOMA, SF*
Two People Under Blankets on Sidewalk, November 8, 2017.

    The hou   years,
"and soared n   acisco
costlier to live in than anywhere else in California, except San Mateo.[29] In fact, it
costs roughly three times the state's median income to purchase a home in San
Francisco.[30] While housing is expensive in San Francisco, so is caring for the
homeless.[31] Reporters estimate that the city spent $275 million on homelessness in

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    28.   *Id.*
    29.   *Id.*
    30.   *Id.*
    31.   Heather Knight, *Despite Money and Effort, Homelessness in SF as Bad as Ever*,
S.F. CHRON. (Sept. 7, 2017), https://www.sfchronicle.com/aboutsfgate/article/Despite-money-and-
work-homelessness-in-SF-as-bad-11242946.php [https://perma.cc/U99L-YQNF] (reporting that
"[o]n the face of it, San Francisco's homeless problem should have improved dramatically over the past

2017.[32] This is a $34 million increase from the prior year.[33] For 2018, it is estimated that the city will spend more than $305 million to address homelessness.[34] Not all of these resources are devoted to securing housing for people who live on San Francisco's streets. Some of the funding relates to cleaning up the homeless camps. A recent report explains, "Public Works cleanup crews were busier than ever, picking up more than 679 tons of trash from homeless tent camps since June 1, 2016, and collecting more than 100,000 used syringes from the camps in that time span."[35] However, despite these investments, the waiting list to sleep in a nighttime shelter bed has risen from 900 to 1,100 people.[36]

The federal government now classifies a family of four earning $117,000 as low income in the Bay Area.[37] This is the highest threshold in the nation.[38] A classification of "low-income" is used by the federal government to determine eligibility for local and federal housing assistance in the United States.[39] To land on this number, "officials at the Department of Housing and Urban Development factor in the median income and the average housing costs in an area."[40] To place this data in context, in the greater New York City area, "where a family of four earning up to $83,450 is classified as low-income, came in at No. 9." [41]

This data does not mean that poor people on average are making $117,000 per year in San Francisco. To the contrary, the vast majority of Bay Area residents who receive housing assistance, such as housing vouchers known as Section 8, "are well below the maximum low-income standard."[42] What this means is that the poor, working class in San Francisco are very poor. In San Francisco, the typical household receiving Section 8 housing vouchers makes less than $20,000 per year.[43] In addition, the average wait time for families receiving Section 8 to move into subsidized housing is sixty-four months.[44] This is what Ken Cole, the county's

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year. After all, last summer Mayor Ed Lee formed the Department of Homelessness and Supportive Housing to focus on the city's most perplexing problem").

32.   *Id.*

33.   *Id.*

34.   *Id.*

35.   *Id.*

36.   *Id.* Nor are San Francisco residents pleased about what they see. In 2016, there were more than 26,000 complaints called into 311 about encampments.

37.   *See* Zraick, *supra* note 27.

38.   *Id.*

39.   *Id.* (noting that qualifying for this program is "different from the federal poverty guidelines").

40.   *Id.*

41.   *Id.*

42.   *Id.*; *see also* Angela McNair Turner, *The Elephant in the Hearing Room: Colorblindness in Section 8 Voucher Termination Hearings*, 13 BERKELEY J. AFR.-AM. L. & POL'Y 45, 54 (2011) (relating the experience of Black women in Section 8 programs, specifically speaking to the ways in which that population suffers unique harms resulting from stereotypes about the "welfare queen").

43.   See Zraick, *supra* note 27.

44.   *Id.*

director of housing describes as being at "the epicenter of the affordability crisis."[45] That is, first responders, teachers, multi-generational residents, and others are priced out of the Bay Area. The *New York Times* dramatized these problems in 2018 with an article, *Down and Out in San Francisco, on $117,000 A Year.*[46]

> It's beyond laughable that a one-bedroom apartment can sell for $1.5 million in San Francisco — and get multiple offers within a day. Or that dumpsters sport satirical "for rent" signs. Or that the asking price for a side order of brussels sprouts at many restaurants is $16. Beyond laughable because such stories pass like a Bay Area breeze in the city named for a pauper from medieval Assisi. But the latest assessment of the out-of-reach quality of one of the world's great places to live came as a real jolt: A family of four earning $117,000 a year is <u>now classified as low income</u> in the San Francisco area. This threshold, used to determine eligibility for federal housing assistance, is the highest in the nation — and no surprise.[47]

Perhaps it is then unsurprising that in San Francisco, "[a] person isn't considered 'wealthy' . . . until their net worth has topped $6 million."[48] Having a "net worth" hovering at $1 million only "makes someone 'financially comfortable,'" according to a study produced by the San Francisco-based investment company, Charles Schwab.[49] San Francisco does not stand alone in struggling to account for and resolve how best to address homelessness.[50] In New York, its homelessness "has reached the highest level since the great depression."[51] However, there is a strong disconnect between the wealth and innovation of Silicon Valley and the poverty and increasing gentrification that surrounds it. The Bay Area—which for the purpose of this Article spans from San Jose through to San Francisco (but can also stand as a metaphor for other growing tech hubs)—seems to be investing in innovation while disregarding humanity passed out on its doorstep.

Unfortunately, these problems are particularly worrisome for women and children.[52] Indeed, the most invisible of San Francisco's housing population are

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45.   *Id.*

46.   Timothy Egan, *Down and Out in San Francisco, on $117,000 a Year*, N.Y. TIMES (July 6, 2018), https://www.nytimes.com/2018/07/06/opinion/san-francisco-housing-homelessness.html [https://perma.cc/C764-SNX7].

47.   *Id.* (emphasis added).

48.   Katy Steinmetz, *Here's What It Takes to Be 'Wealthy' in San Francisco*, TIME (Apr. 14, 2016), http://time.com/4294407/san-francisco-wealth/ [https://perma.cc/F9XT-RCCV]; *see also* Zraick, *supra* note 27.

49.   *Id.*

50.   *See* John Misachi, *10 US Cities With The Largest Homeless Populations*, WORLD DATA ATLAS (Feb. 19, 2018), https://www.worldatlas.com/articles/10-us-cities-with-the-largest-homeless-populations.html [https://perma.cc/H2DV-34B7].

51.   In New York, there are more than 75,000 people who are homeless. In Los Angeles City and County, there are more than 55,000 people who are homeless. *Id.*

52.   *See, e.g.*, Jennifer Friedenbach & Valerie Schmalz, *SF Must Help Pregnant Homeless Women Qualify for Housing*, S.F. CHRON. (June 7, 2018), https://www.sfchronicle.com/opinion/openforum/article/SF-must-help-pregnant-homeless-women-qualify-for-12976596.php [https://perma.cc/YB76-7SZ5].

pregnant women.[53] According to local advocates, "Because of a gap in San Francisco's emergency housing policy, those women are frequently homeless throughout pregnancy."[54] San Francisco's female homeless population has given birth on the streets; they live in tent encampments, sleep in doorways, cars, and shelter themselves against buildings. For these reasons and more, they are considered "high risk" for premature births, miscarriages, and stillbirths.

This study spanned one-and-a-half years of research.[55] It is built upon a mixed methods research design that engaged both qualitative and application-based research. The qualitative component involved randomized interviews in Oakland and Palo Alto, California, as well as interviews with senior stakeholders in the tech economy. The interview cohort included community, government, philanthropy, and Silicon Valley leadership. The qualitative methodology of this study included in person and phone interviews. Finally, this research benefited from a literature review that included expansive data review of primary and secondary sources. Given the nascent nature of the field, primary resources were significantly relied upon, such as news periodicals.

This Article engages the intersection of (primarily computing)[56] technology and society in four parts. Parts I, II, and III of this Article address what I refer to as the "curse." Part I focuses on automation because that seems to be the most powerful force pushing those in Silicon Valley to reconsider the economic impact of technology. Part II address the lure of innovation as that seems to be the leading factor preventing the public from holding corporations responsible. Part III turns to infrastructure, focusing on the measurable impact tech companies have on communities and zooming out to the globe. It also considers cures, including self-initiated philanthropy, and concludes by introducing a policy inspired by the merits of universal basic income as a means to address the limitations of technology brought on by the current status of automation, innovation, and infrastructure.

PART I — AUTOMATION

There is a difference between automation and artificial intelligence (AI). Automation is the act of making a process run without human interference. Contrary to what one might think, this does not require much intelligence, at least not in the traditional sense. Think of typical factory work—repeating the same task in assembly to increase efficiency—there is no need for a deeper sense of purpose.

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53. *Id.*

54. *Id.*

55. The project received institutional review board (IRB) approval, to advance its application-based research. IRB approval was granted in 2017 by Stanford University to conduct user tests of an application designed and built as part of this graduate research. The application underwent numerous refinements and benefited from test-users' feedback in its design and implementation.

56. "Technology" is an imprecise term representative of multiple fields. Most examples in this paper refer to technology in the lens of software, but some examples and frames can be expanded to other forms of technology.

In fact, most assembly work does not require any domain knowledge outside of that specific goal. Even if one programmed all factory tasks onto the same system, the machine would still only be able to run factories well, not build relationships or contemplate its existence.

Modern artificial "intelligence" is typically associated with machine learning, a subset of advanced statistical analysis that can only be achieved with the assistance of a computational device due to time constraints. These programs work by using existing data to build algorithms that can make predictions or associations from similarly formatted input. There are three main categories of machine learning: supervised, unsupervised, and reinforcement. Supervised programs are built from datasets with known outcomes. The duty of the algorithm is then to mimic previously existing data. Unsupervised algorithms have no goal outcome. Instead, they work to perform tasks like clustering and anomaly detection. Reinforcement learning uses prior data from trial and error of the program itself as it attempts to get closer to realizing a goal like reaching the end of a maze.[57] This list of techniques is not exhaustive and different methods can be combined depending on the purpose of the system.

One method that has resulted in higher accuracy of these programs is the use of neural networks. Neural networks mix data input which then creates new variables, which too can be mixed and scored at different levels of importance to predict outcomes. For example, imagine a group of researchers have access to a dataset on individuals' height, weight, eye-color, ethnicity, and body fat percentage and want to use it to create a program to predict whether or not an individual has a high bodyfat percentage from the easier-to-measure aforementioned factors. In the process of building a neural network one might run thousands of iterations to find the best combinations of those factors to determine bodyfat percentage. It could be that weight and height have a much stronger impact on the outcome. But such a system could also account for differences in body type typically associated with ethnicity that are lost in traditional weight health checks like BMI.[58]

The importance of the transition from decision tree system forms of artificial intelligence to the currently popular methodologies is the premise that *learning* is a central factor for intelligent systems—if a robot can teach itself how to "think" then the limits of intelligence are unimaginable.[59] Systems using neural nets have the

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57. Google DeepMind developed three different virtual figures that could sense their virtual environment and move their appendages and gave them the goal of reaching the end of an obstacle-course-like environment. Through iterations of processing its own successes and mistakes, it was able to "learn" how to run, jump, and climb. NICOLAS HEESS ET AL., EMERGENCE OF LOCOMOTION BEHAVIOURS IN RICH ENVIRONMENTS (July 10, 2017), https://arxiv.org/pdf/1707.02286.pdf [https://perma.cc/S895-EABQ].

58. It has been shown that BMI has inconsistencies between ethnic groups, as it does not account for differences in fat distribution. E.C. Rush et al., *BMI, Fat and Muscle Differences in Urban Women of Five Ethnicities from Two Countries*, 31 INT. J. OBESITY 1232 (2007).

59. *See* Frank Pasquale & Glyn Cashwell, *Four Futures of Legal Automation*, 63 UCLA L. REV. 26 (2015) (applying these concepts to law, noting "[s]cholars have addressed the automation of

ability to learn tasks formerly too complex to automate, but as the nets grow deeper and more complex, they become too challenging for humans to interpret—even by the engineers who make them.[60] Automation and AI overlap, but too often any system that can complete tasks formally attributed to humans is classified as "intelligent" when in actuality the system is incapable of *thinking* for itself in the traditional sense of the word.

This Article begins with automation because it seems to be the most powerful force pushing those in Silicon Valley to reconsider the economic impact of technology.[61] For decades, humans have feared that robots will take over the world. These concerns have traditionally revolved around robots annihilating humanity or using human bodies as their slaves.[62] Only more recently has a legitimate concern grown that capitalism will drive businesses to replace human workers with automation, thereby destroying countless livelihoods.[63] For example, researchers at MIT and Boston University, Daron Acemoglu and Pascual Restropo, argue the following in a recent working paper:

> In contrast to prevailing presumptions in much of macroeconomics and labor economics, which maintain that productivity-enhancing technologies always increase overall labor demand, the displacement effect can reduce the demand for labor, wages and employment. Moreover, the displacement effect implies that increases in output per worker arising from automation will not result in a proportional expansion of the demand for labor. The displacement effect causes a decoupling of wages and output per worker, and a decline in the share of labor in national income.[64]

The fear is growing so strong that leaders in Silicon Valley, arguably the tech hub of the world, are advocating for solutions ranging from taxing robots to individual, universally distributed periodic cash payments (otherwise known as universal basic income).

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legal processes since at least the 1960s. None foresaw all the critical developments of the past two decades and detailed prognostication is still a fool's errand"). Other scholars have considered what automation might mean in law enforcement. *See, e.g.*, Woodrow Hartzon et al., *Inefficiently Automated Law Enforcement*, 2015 MICH. ST. L. REV. 1763, 1764–65 (2015) (observing that "[w]hile it may sound like science fiction, the automation of law enforcement is already here").

60.   Will Knight, *There's a Big Problem with AI: Even Its Creators Can't Explain How It Works*, MIT TECH. REV. (Apr. 11, 2017), www.technologyreview.com/s/604087/the-dark-secret-at-the-heart-of-ai [https://perma.cc/UE59-WNAT].

61.   *See* Dan Acemoglu & Pascual Restrepo, *Artificial Intelligence, Automation and Work* 3 (Nat'l Bureau of Econ. Research, Working Paper No. 24916, 2018) (manuscript at 1) (on file with author) ("[W]e are far from a satisfactory understanding of how automation in general, and AI and robotics in particular, impact the labor market and productivity. Even worse, much of the debate in both the popular press and academic circles centers around a false dichotomy.").

62.   Popular movies like *The Matrix* and *Terminator* cast a gloomy lens on a robotic future. THE MATRIX (Warner Bros. 1999); THE TERMINATOR (Hemdale 1984).

63.   *See* Acemoglu & Restrepo, *supra* note 61, at 1.

64.   *Id.*

Elon Musk, founder and CEO of Tesla and formerly PayPal, announced that a basic income was inevitable[65] and Bill Gates, one of the men behind the modern home computing system, declared that robots will need to carry their weight.[66] Even a venture capitalist firm, Y-Combinator, grew so concerned about the trajectory of automation that they created their own nonprofit to run a basic income study in the United States.[67] It should raise some level of alarm that wealthy tech leaders are advocating for systems so radical to counteract the systems they create.

Given that the wealth needed to fund a program like universal basic income would likely need to at least be partially derived from those with the most capital, one should question why tech leaders are advocating for such social systems. Perhaps they stand to gain so much from artificial intelligence that the amount deducted from redistributive taxes would be negligible in comparison to gains. Maybe they are inspired from the science fiction utopia of building a functioning society where not only the rich have the option to work. Or, perhaps, they are worried about the social unrest that could follow from mass labor market displacement.

A. Increasing Wealth

Traditionally new sectors have been born from the automation of old ones, causing the nation to prosper. This was true during the industrial revolution, when work commonly consisted of assisting machines to complete previously time-intensive, complex, or impossible tasks.[68] Automation saved time, increasing the output to labor ratio and decreasing prices. It allowed a wider range of income levels access to the spoils of the time.

Yet, is the same phenomenon occurring today? From the mid-1940s to the late 1970s, most income groups in the United States were on average able to double their wealth. This shifted in the late 1970s when the median and twentieth percentile wealth groups stagnated.[69] Essentially, wealth gained as a nation no longer meant equal improvements for all. The advantaged reaped the most rewards. While increases in U.S. wealth inequality are likely due to systematic reasons, including

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65.   Chris Weller, *Elon Musk Doubles Down on Universal Basic Income: 'It's Going to Be Necessary'*, BUS. INSIDER (Feb. 13, 2017), http://www.businessinsider.com/elon-musk-universal-basic-income-2017-2 [https://perma.cc/LQ6B-9DZY].

66.   Kevin J. Delaney, *The Robot that Takes Your Job Should Pay Taxes, Says Bill Gates*, QUARTZ (Feb. 17, 2017), qz.com/911968/bill-gates-the-robot-that-takes-your-job-should-pay-taxes [https://perma.cc/CXG3-APU3].

67.   Sam Altman, *Moving Forward on Basic Income*, Y COMBINATOR (May 31, 2016), https://blog.ycombinator.com/moving-forward-on-basic-income [https://perma.cc/JJ5T-EXHR].

68.   Acemoglu & Restrepo, *supra* note 61, at 3 ("Production in most industries requires the simultaneous completion of a range of tasks . . . . Each one of these tasks can be performed by a combination of human labor and machines. At the dawn of the British Industrial Revolution, most of these tasks were heavily labor-intensive (some of them were merely performed).").

69.   Chad Stone et al., *A Guide to Statistics on Historical Trends in Income Inequality*, CTR. BUDGET & POL'Y PRIORITIES (Dec. 11, 2018), www.cbpp.org/research/poverty-and-inequality/a-guide-to-statistics-on-historical-trends-in-income-inequality [https://perma.cc/J5LB-59H3].

free-market capitalism and tax cuts for the wealthy,[70] it goes to show that advancing automation does not ensure economic advancement for all.

Although technology boomed in the late twentieth century—bringing society from records to Spotify, rotary phones to iPhones, postcards to Facebook Messenger—wealth inequality steadily increased. While tech companies may not be the originating source of this trend, they are now the wealthy actors operating in an unsustainable system. Tech corporations create tools that increase efficiency. Surplus wealth, once lost from inefficiencies such as paying human workers, non-digital processing, and storing physical data, now goes to those with enough capital to afford the tool. In other words, the beneficiaries of technology are the ones who can afford it.

Tech companies also are uniquely positioned to build, as Alphabet CEO Larry Page phrased, businesses that pass the "toothbrush test." The toothbrush test is defined by "something you will use once or twice a day, and . . . make[s] your life better."[71] This occurs when a company creates a service people were initially unaware they *needed*, making a preexisting process simpler, sleeker, and better than the alternative. Benignly useful at first, they soon erode preexisting markets as people grow dependent to the path of least resistance.

Amazon is a prime example of this trend. Although Amazon had a net profit hovering at zero until recent years, they successfully "sold six times as much online as Walmart, Target, Best Buy, Nordstrom, Home Depot, Macy's, Kohl's, and Costco did combined."[72] Their strategy is to devour all markets, buying out competitors. Amazon now owns Whole Foods, has entered the film industry, has started creating consumer electronics, and has a stronghold on cloud computing services with clients including Adobe, Comcast, Spotify, and Airbnb.[73] With the help of automation to reach and advertise to a wide consumer base, Amazon can afford to underprice services and still make a profit.

Uber and Lyft followed suit. They not only automated the task of flagging taxis, but also engineered the prevalence of transportation at prices comparable yet more convenient than public transit. Most Uber and Lyft drivers that I talked to between 2017 and 2018 were grateful for the service but disappointed by shrinking payouts. Although the technology is available to provide full transparency, riders

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70.   Robert Reich, *The Real Reason for the Growing Gap Between the Rich and Poor*, NEWSWEEK (Sept. 28, 2015), www.newsweek.com/real-reason-growing-gap-between-rich-and-poor-377662 [https://perma.cc/3QDJ-SC8Y].

71.   David Gelles, *In Silicon Valley, Mergers Must Meet the Toothbrush Test*, N.Y. TIMES (Aug. 18, 2014), https://dealbook.nytimes.com/2014/08/17/in-silicon-valley-mergers-must-meet-the-toothbrush-test [https://perma.cc/3EXC-X42P].

72.   Robinson Meyer, *When Does Amazon Become a Monopoly?*, ATLANTIC (June 16, 2017), www.theatlantic.com/technology/archive/2017/06/when-exactly-does-amazon-become-a-monopoly/530616 [https://perma.cc/3M9B-6Q59].

73.   "Case Studies & Customer Success." Amazon Web Services, Inc., Amazon, aws.amazon.com/solutions/case-studies/.

are left uninformed of what their driver earns, and, on Uber, some drivers who compare receipts with riders have noticed large price discrepancies. Examples include "one driver [who] claimed Uber paid him $59, including $20 for tolls, for a trip from the airport that cost his passenger $127."[74]

In an April 2017 court filing for secretly overcharging riders and underpaying drivers, Uber claimed that the pay discrepancy "was hardly a secret" and that it was in full right to do so based on its driver contract.[75] Meanwhile, Bloomberg News reported that the strategy of commissioning drivers for time and distance while riders pay in advance based on demand might help Uber increase company revenue.[76]

A new job market opened, one that appears to benefit the consumer with convenience and low prices, but slowly chips away at other services and strongly benefits the middleman. By being strategically priced between taxis and public transportation, but more convenient than both, Lyft and Uber can "generate wealth" by redistributing cash into their own pockets with the power of automation—a trend easy to reproduce and profit from for tech corporations.

B. Human to Robot

In the Valley, driverless cars hopelessly attempt to blend in with automatic and manual transmissions on roadways. Uber and Google have both invested in driverless cars. Uber's relatively new trucking service[77] has already made autonomous deliveries in Arizona, albeit with a human driver poised for emergencies. Uber's "eventual goal [is] to eliminate human drivers inside the cab."[78] This objective is understandable from the corporate perspective—an automated truck does not need to take rest stops, will not get drowsy behind the wheel, and, short of running someone over, cannot negatively represent its employer. An automated truck does not need sick days, a vacation, or to see its family. It will not fight for benefits or higher wages from its employer. An automated truck does not

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74.   Alison Griswold, *Uber Drivers Are Using This Trick to Make Sure the Company Doesn't Underpay Them*, QUARTZ (Apr. 13, 2017), qz.com/956139/uber-drivers-are-comparing-fares-with-riders-to-check-their-pay-from-the-company [https://perma.cc/X828-CX5A].

75.   Van v. Rasier, LLC, No. 2:17-cv-02550, 2017 WL 1278763 (C.D. Cal. Apr. 3, 2017).

76.   Eric Newcomer, *Uber Starts Charging What It Thinks You're Willing to Pay*, BLOOMBERG (May 19, 2017), www.bloomberg.com/news/articles/2017-05-19/uber-s-future-may-rely-on-predicting-how-much-you-re-willing-to-pay [https://perma.cc/X6JF-AFH9].

77.   Uber bought Otto, an autonomous trucking company in 2016 and later that year completed its first shipment, teaming up with Budweiser. Uber Advanced Technologies Group, *Otto and Budweiser: First Shipment by Self-Driving Truck*, YOUTUBE (Oct. 25, 2016), https://www.youtube.com/watch?v=Qb0Kzb3haK8 [https://perma.cc/H3YB-L65W].

78.   Daisuke Wakabayashi, *Uber's Self-Driving Trucks Hit the Highway, but Not Local Roads*, N.Y. TIMES (Mar. 6, 2018), www.nytimes.com/2018/03/06/technology/uber-self-driving-trucks.html [https://perma.cc/9PCR-2F4N].

need to be made happy. Truck driving, the most popular employment in most United States,[79] is on its way out.

If only truck driving jobs were disappearing, it would be easy for a non-truck driver to say, "The disappearance of truck driving is for the betterment of humanity, those jobs were unhealthy anyway, just find new work like farmers did after the industrial revolution." The unfortunate predicament then becomes what new job former truck drivers should get. Should they get a job in fast food or retail which are also being replaced, albeit at a slower rate?[80] Should they go back to school so that they can attain a career that requires a higher level of education like law or medicine, which are also being enhanced by artificial intelligence?[81] Should they learn how to code so that they can contribute to the same system that led to the end of their livelihood?

If the cycle continues, new jobs created from technological advancement may face increasingly short lifespans until they are similarly replaced. Meanwhile, without a great systematic shift, those at the top will continue to ride growing waves of wealth, "earning" the privilege to live off of their capital without engaging in traditional work. Those at the bottom may find increasingly less work available that can subsidize a base standard of living at skill levels that do not require capital to attain. As more resources are generated from technology, it will grow increasingly senseless to force humans to work to earn a base standard of living, especially if that work can be done more efficiently by a machine counterpart. Forcing unnecessary human employment on the free market would lower human pay since machines work for free—after the initial purchasing price, maintenance, and the energy required to run them. If firms were forced to hire human workers at a minimum wage, they would not be able to lower prices to the extent afforded by not having to pay human employees, thereby, depending on the product, hurting the very income group the artificially created jobs were intended to assist.

Moreover, forcing people to work to make ends meet, when jobs are unnecessary and money accumulates for the few, excludes the lower income class from opportunities to build capital, thereby deepening poverty and exclusively privileging those with wealth to not need to work to make a living. If money is not rerouted to those in need at a rate that balances wealth accumulation at the top, then, as society advances, some will be left behind through no fault of their own while others advance through little effort of their own. Wealth redistribution is essential—whether the government pays companies to hire workers, forces companies to lose profits by hiring unnecessary workers, creates and subsidized

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79. Quoctrung Bui, *Map: The Most Common Job in Every State*, NPR (Feb. 5, 2015, 3:31 PM), https://www.npr.org/sections/money/2015/02/05/382664837/map-the-most-common-job-in-every-state [https://perma.cc/E7LM-FT85].

80. Martin Ford, The Rise of the Robots: Technology and the Threat of Mass Unemployment 12 (2016).

81. Mark Walker, Free Money for All: A Basic Income Guarantee Solution for the Twenty-First Century 97 (2016).

unnecessary jobs, or offers free retraining and temporary allocation of basic needs like food and housing.

The aforementioned options may seem promising today—for this reason, the popular solution, retraining, will be discussed more thoroughly in the following section below. That said, these options grow less reasonable in the context of a highly automated world where human work is no longer *required* to run a high-functioning society. Artificially forcing humans to work to achieve a basic standard of living holds back both human and technological potential. In an automated future, firms will make large profits with few workers and "new jobs" will constantly be automated. The automation of work is bound to be a continued cycle, because as long as profits are diverted to human workers it is in a firm's best interests to automate. If splitting the spectrums of humanity between those who can afford to not work and those who cannot afford to find work is deemed unethical, why not tie together the loose ends and give surplus funds generated from automation directly to those that need it?

Whether or not an automation dominated workforce is possible, or even likely, should not detract from the fact that people are already losing jobs to automation and cannot afford to meet their basic needs. What if instead of robots replacing 100% of the work currently available, 50%, 25%, or even 10% of work was lost to automation, even if just temporarily? Would the most privileged need to lose employment before society admits that engagement in unnecessary and unavailable jobs is a poor precursor to a basic standard of living? "The market" cannot determine fair payment when some workers compete against automation and others work with it.

C. Job Mismatch

Retraining has been touted as a solution to the woes of increasing automation. This argument assures the worried that there will always be necessary human work available, while implying that human work will be forever *necessary*. For those in positions of power, who care about workers but still fire good employees when fiscally advantageous, there remains an illusion that their ex-workers will simply find a different career. State unemployment benefits work under the same assumption—if an employee is terminated from her job "through no fault of [her] own," she can receive up to twenty-six weeks of government checks worth a percentage of her prior income capped at the state maximum.[82] To remain eligible, an individual might need to show completed job applications each week or submit requests to keep receiving pay. For those whose "job openings in [their] field are limited, [the state unemployment office] can offer testing and counseling to

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82. *State Unemployment Insurance Benefits*, U.S. DEP'T OF LABOR: EMPLOYMENT AND TRAINING ADMIN., https://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp [https://perma.cc/DZ2P-E3ZQ] (last updated June 6, 2018).

determine other jobs [they] might like to do and are able to do" and, in times of high unemployment, benefits may be prolonged.[83]

Currently, employers are taxed proportionally to the amount of former workers that successfully file for unemployment benefits. While in theory, taxing companies that fire employees combined with offering short-term government unemployment benefits may seem like an equitable solution, it largely ignores the impact of automation. If an individual loses a job due to automation, it is likely that the market will be oversaturated with people, like them, who have a skill that is no longer financially viable. Both the magnitude of people looking for the same work and competition from robots will pull wages down on the free market. Meanwhile, the company that lets them go stands to not only save money from workers' wages, but also increase output via automated tools. Finally, the third actor, the producer of the automation, likely makes the greatest return on investment. The producer might do so well that they hire more engineers and not face tax increases to subsidize unemployment benefits.

One in four workers are now self-employed members of the gig-economy.[84] As contractors, they lack employers and are not guaranteed to receive unemployment benefits. If their self-generated career dissolves, they may be left without financial support to find their next gig or have to pay to retrain for a job that might one day be automated away. If the gig worker is lucky, they may have savings to keep them afloat—if they are like most Americans they will not.[85] While former gig-workers and the recently unemployed look for work in competition with automation, the owners of the robots become wealthier without necessarily working more.

Furthermore, the unemployed must also compete with young adults entering the job market, who may have more time to invest in their careers and less fatigue from raising families, paying mortgages, and being forced to bop around careers. The cycling labor market in the autonomous future consists of those who can afford to not work; those fortunate enough to have interest and training in currently valued work; those uniquely skilled and charismatic enough to succeed temporarily in the highly competitive gig economy; and the unemployed, entering or reentering a swiftly automating job market.

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83.   *Id.*

84.   An October 2016 McKinsey report estimates that 20-30% of workers are "independent workers." MCKINSEY GLOB. INST., INDEPENDENT WORK: CHOICE, NECESSITY, AND THE GIG ECONOMY 7 (2016), www.mckinsey.com/~/media/McKinsey/Global%20Themes/Employment% 20and%20Growth/Independent%20work%20Choice%20necessity%20and%20the%20gig%20 economy/Independent-Work-Choice-necessity-and-the-gig-economy-Executive-Summary.ashx [https://perma.cc/R97U-X89F].

85.   The Survey of Household Economics and Decision Making conducted in October 2016 found that "44 percent of all respondents could not cover an unexpected $400 emergency expense or would rely on borrowing or selling something to do so." *Federal Reserve Board Issues Report on the Economic Well-Being of U.S. Households*, FED. RES. (May 19, 2017, 12:00 PM), www.federalreserve.gov/ newsevents/pressreleases/other20170519a.htm [https://perma.cc/B7CK-5DEJ].

If the goal is for all members of society to *earn* the right to a basic standard of living—"earning" defined by working for an income that adds value to the free market economy—then free training with subsidized basic needs and job placement must be offered to the jobless. Free public high school used to pay for all an individual needed to know to earn a job for life plus retirement benefits. Now the unemployed may never have access to a basic standard of living because they lack the capabilities to earn a job in the first place.

When economists predict that "new work will be created," it is rarely followed by what type of work, for what kind of pay, and how people will prepare to take those jobs. Humans can "make a living" taking care of a stranger's family, but not earn a cent cooking for, cleaning after, and raising their own. One could make over a hundred dollars driving a rich person to the airport but not be paid anything for dropping off a neighbor. Why does an activity only count as work if someone else pays them to do it? There are naturally attractive people that are millionaires for posing in front of cameras, while others must pay people to take photos of them. Is it in the best interests of humanity for the value of time to be quantified by how much one is being paid for it?

Maybe the definition of work could be expanded so that income becomes a function of generating societal, and not just economic, value. This would reframe earning the right to a basic standard of living from traditional work to adding value. But then "value" becomes difficult to measure, register, and track. Does a good surfer add value but not a novice?[86] How will a novice surfer become good if not given the time and resources to practice? Does giving a neighbor a ride or mowing a friend's lawn still have value when a bot does an equal or better job? If there is no need to work, then might there be an inherent value for simply existing? The more automation drives the economy, the less *need* there will be for humans to push it forward. The creation of nameless new jobs should not imply that all must have one to make their basic needs met, especially when money is disproportionally conglomerated by the users and creators of automation.

Even if all do find work, however short term, in an automated future, they will likely face lower wages, higher instability, and a growing wealth gap between them and those who advance not for their higher human capability but their access to automation. In this lens, some form of wealth redistribution remains necessary to prevent those unfairly benefited from having an insurmountably higher living standard than everyone else. It is not fair for those working to live to spend the majority of their income on basic needs, while the benefactors of automation have

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86.　　Philosopher Philippe Van Parijs is often cited for the premise that universal cash grants promote a social good. That is, Universal Basic Income, regardless of monetary or other contributions to society, promotes equality and increases liberty for all. He responds to a Hawaiian mandate that residents must wait a full year before receiving certain welfare benefits by explaining why surfers deserve to be fed. Philippe Van Parijs, *Why Surfers Should Be Fed: The Liberal Case for an Unconditional Basic Income*, 20 PHIL. & PUBLIC AFF. 101–31 (1991).

the freedom to use excess money to make more money. The existence of new jobs is irrelevant to whether or not redistribution must occur in an automated future.

D. Standards of Living

When one pictures gross national wealth and its distribution, there are three possibilities at any given time. First, there is a stagnant amount of wealth in the economy, in which case one's success is directly connected to another's decline. Second, wealth grows, in which case there should be no reason why wealth should only increase for some and on a much greater scale. Third, wealth declines, in which case it is completely unfair that some keep taking, making the losers lose at more severe rate. The problem is not people getting fired, losing their jobs, and finding new careers as much as some growing poorer while others' wealth increases.

Today's poor have conveniences that prior generations lacked. From cellphones to sturdier clothing and washing machines. Some argue that the innovations assisting the increasing wealth gap are worth it because, compared to decades prior, the least well-off are not as destitute as previous generations. This is a slippery slope—advancing technology has caused standards of living to rise, *not* made the poor suddenly well-off. Wealth is a relative scale. It would be cruel to subject those living in industrialized nations to eighteenth-century style medical procedures like bloodletting because it was an improvement over when there were no doctors at all. Yet it seems reasonable for a guy driving a Tesla to say, "You should be grateful for your broken-down Chevy because without all this innovation you could just as easily not have a car."

Automation directly affects standards of living, increasing available time and resources for those who can afford it. If automation is only available to a small subset of society then that subset will have a quality-of-life improvement that others lack. Currently, automation is primarily advanced by those who have the skills and funding to build tools for their own self-interests—to fix their own problems and the problems of wealthier people who will pay them for it. This means that the base standard of living continues to improve at a more rapid rate for the upper middle class and above. Without interventions, lower income groups do not benefit when and if the technology eventually trickles down to them—at that point they are already a generation behind. Unless automation advances are inclusive of those with the least, wealth and standard of living gaps will continue to increase.

Conclusion: Automation is increasing wealth at a higher proportion for those that are already wealthy. Human work is being replaced by robots. Perhaps new jobs will be created, but people need resources in order to be retrained. In addition, with the current rate of technological growth, it is likely new jobs will too become automated. Standards of living are rising, but wealth inequity is growing, so those with fewer resources struggle to meet a basic standard of living. It is clear that a main source of these trends is automation. If automation is to increase productivity for all, then wealth must be redistributed, whether or not new jobs are created.

PART II – INNOVATION

"I think because people are here they want to do start-ups and make money, I just want to point out that if you want to make money, don't bother with a startup, create an industry. Because then you get trillions instead of billions. So it's about a factor of a thousand between doing invention over innovation. In other words, not going incrementally from the present. But carving out a whole new set of ideas, it creates an entirely new context."[87]

Alan Kay, one of the people who helped mold the modern concept of computer programming, spoke at Stanford's Start Up School, a class sponsored by the investment firm, Y-Combinator, to teach both Stanford students and guests how to become successful entrepreneurs. He challenged the class to differentiate between innovation and invention. Invention is building something completely new that the market might not be ready for, while innovation is slapping preexisting elements together and reframing them to be marketable. His team in the Palo Alto Research Center (PARC) built works of invention—redefining the limits of computer science to the great benefit of all that followed. His contributions include but are not limited to object oriented programming, windows, graphical user interfaces, and the concept of handheld computing devices. He believes we have barely touched the capabilities of computer science.

Despite his advice, Alan Kay is not a trillionaire, yet the company that used much of his research and then hired him, Apple, may soon be the first trillion-dollar industry. With a few exceptions, Apple has excelled at *innovating*, not inventing. They have let others make the wheel and then presented a much shinier version. They pioneered dumbing down devices for users, limiting hardware compatibility with competitors, and selling updated versions of practically the same tools which break down just in time without warning to buy the next model. For its lack of invention, Apple is doing swimmingly. Why take risks when you can get guaranteed rewards? Why make platforms open source when you can keep your functionality a mystery and make more money? Why take your time to research and develop a far superior product when you can release a thinner version with a slightly better camera and a few bugs from the last cycle fixed and double last year's revenue? It seems that the market has a pension for rewarding innovation, and due to, or in spite of that fact, people assume innovation is inherently good.

A. The Myth of Inherent Value

Innovation is often assumed as inherently good. Progress, no matter the direction, is better than stagnation. But as technology grows increasingly powerful it may be useful to question that narrative. Innovation comes with a price—it moves the world, but not necessarily for the best. It just guarantees change, not necessarily progress. Change can be positive, lateral, or negative.

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87.   Alan Kay, *How to Invent the Future I Address*, https://jotengine.com/transcriptions/ew4Ff2gdicfUqwg7ogy2Eg [https://perma.cc/3Y8V-S8TZ] (last visited June 16, 2019).

In 1939, Albert Einstein presented the "military potential" of nuclear chain reactions to President Franklin D. Roosevelt.[88] That military potential led to the Manhattan Project and the creation and deployment of atomic bombs.[89] While nuclear research led to efficient power plants, it also brought the deaths of hundreds of thousands and increased bullying capabilities for wealthy military-loving nations to build their own. The U.S. government pushed for that innovation knowing the risks. Given the harm that nuclear bombs have caused, it is doubtable that the innovation was *inherently* good. Rather, nuclear technology has spurned both positive and negative repercussions. It is unrealistic and dangerous to solely focus on the positive side effects as if innovation is unequivocally positive.

When measuring value, it is essential to examine who the change affects. A utilitarian mindset might suggest that innovation can only be inherently good if it causes a net increase in utility. An innovation that primarily improves the well-being of those already well-off is inefficient at achieving this goal, since arguably, improving the lives of those worse off generates more overall utility than improving the lives of those with plentiful resources. Firstly, the wealthy are a minority population, so less people can experience the improvement. Secondly, the net improvement from a higher quality of life than everyone else to an even higher quality of life has marginal returns because there is no underlying need for the change—the joy of going from starving and unsheltered to fed and housed is likely to be an order of magnitude higher than upgrading from an iPhone to an iPhoneX. This is because one requires the other—what good is an iPhoneX if one is starving and homeless?

Tools that exclusively improve the lives of the most well-off, especially their productivity and ability to make money, actually make those with less resources worse off by increasing the wealth gap. Conversely, equally accessible innovations, while not reversing global inequality, at least advance society as a whole. Arguably, the most inherently valuable innovations are the ones that target the needs of those with the least because they raise the bottom line below which any member of society can fall.

It seems that the inherent value of knowledge is often confused with the value of corporate innovation. It is possible to think that increasing the knowledge of humanity is good while admitting that not all innovation is valuable. The problem with corporate innovation is that it is not produced for increasing public knowledge but for increasing private profit. The pursuit of knowledge is admirable but there is no inherent value to creating tools—the value is outcome dependent. CRISPR-Cas9, the microbial adaptive "find-and-replace" gene that sprung up in the media in 2015 when Chinese scientists edited a human embryo, remains a huge leap

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88. *Manhattan Project*, ENCYCLOPÆDIA BRITANNICA (July 18, 2017), https://www.britannica.com/event/Manhattan-Project [https://perma.cc/6KZR-4GNR] (last visited June 16, 2019).

89. *Id.*

forward in the knowledge and development of humankind.[90] It has been used to improve the durability and nutrition of crops and to correct a disease that causes genetic mutations in mice. It has also been developed into a virus that mice can breathe in, "allowing the CRISPR system to engineer mutations and create a model for human lung cancer."[91] The knowledge of CRISPR may be an inherent good given its possibilities for human advancement, but the value of what is developed from it and released to market depends on its merits and consequences.

Only pure not-put-to-practice knowledge may be considered good on its own accord. When measuring if innovation is actually beneficial to society, it is essential to assess the consequences. What sort of negative and positive implications does the technology create? Who is primarily affected by those positive and negative outcomes? Does the innovation come with tools to mitigate the worst possible effects? If the technology is an open unknown to these questions, then it does not have an inherent value. Creating something new does not imply that it benefits humanity and thus should be built without responsibility for its repercussions. Innovation comes with a price. Too often, the fear of slowing innovation is greater than that of letting social issues unfold.

Profiting from engineering problems for society without assisting in alleviating them (or preventing them in the first place) is obviously problematic. However, what about more generally profiting from new ideas? Something does not need to live up to the lofty goals of benefitting all humanity to deserve compensation, right? Well, current "innovation" is quite stifled by monopolies— more precisely, patent trolling, buying smaller companies to re-appropriate them, and large barriers to entry. Moreover, some of the most commonly used technologies advance from collecting and selling information that users must sign away in complex Terms and Condition forms in order to use the product.

If one starts asking around, one may notice that many engineers in Silicon Valley can recall their first patent registered by their company's legal department or at least can name someone on their team who has a company patent. Both preliminary concepts and fully thought out designs are patented so that the "original" concept cannot be stolen or claimed to have been stolen in a lawsuit. Due to employee contracts, the patent commonly belongs to the corporation and not the individual creator. The employee cannot leave with her idea and build her own platform. When employees start their jobs as software engineers they typically sign contracts that make any innovation they come up with while working for the company, whether for the corporation or as a personal project, at least partially owned by their employer.[92] If a talented engineer wants to create something independently without the possibility of facing legal repercussions, she should quit

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90.   Heidi Ledford, *CRISPR, the Disruptor*, NATURE (June 3, 2015), www.nature.com/news/crispr-the-disruptor-1.17673 [https://perma.cc/WL97-NR7Q].

91.   *Id.*

92.   Orly Lobel, *My Ideas, My Boss's Property*, N.Y. TIMES (Apr. 13, 2014), www.nytimes.com/2014/04/14/opinion/my-ideas-my-bosss-property.html [https://perma.cc/7A2C-5H4M].

her job first, otherwise she may be beholden to her company that can claim ownership of the idea and sue anyone outside the corporation who wants to actually build something useful from it.

Worse than being sued by a former employer for an original idea might be being sued by an entity that did not create or use the patent that they own. Enter patent trolls—corporations that do not make technology, but buy patents and threaten small corporations that are likely to settle or pay a continued royalty. Back in 2013, Soverain was successfully brought down by Newegg after a six-year battle.[93] At the time, Soverain already had several pending lawsuits against corporations including Nordstrom's, Williams-Sonoma, Home Depot, Oracle, and eBay—and had successfully won against Victoria's Secret and Avon. Its claim was that they had proprietary rights to website "shopping carts" between patents 5,715,314 and 5,909,492.[94] While reforms won by the patent office have helped quell the patent trolling madness,[95] extortion continues. The Electronic Frontier Foundation (EFF), "the leading nonprofit organization defending civil liberties in the digital world,"[96] released an article in February 2018 describing a group with a different name but overlapping actors as previous patent trolling ploys.[97] This group, Motivational Health Messaging LLC, wrote a letter to the ring wearable startup Motiv asking for $35,000 to license its patent. It claimed to have the rights to pair a "personal electronic device" with a system "for delivering activity based suggestive . . . messages."[98]

While the patent office could do better to filter reasonable patents from the ridiculous, what corporations are willing to patent shows how little the free market should be trusted to encourage innovation. Amazon famously patented "1-Click" shopping so that from 1999 to 2017 no one could checkout in one click from a website.[99] Apple patented swipe to unlock,[100] which led to three years of back and

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93. *Newegg Wins Key Shopping Cart Patent Lawsuit*, NEWEGG (Jan. 28, 2013), https://www.newegg.com/d/Info/NewsroomDetail?ID=1120&Type=3.

94. Joe Mullin, *How Newegg Crushed the 'Shopping Cart' Patent and Saved Online Retail*, ARS TECHNICA (Jan. 27, 2013), https://arstechnica.com/tech-policy/2013/01/how-newegg-crushed-the-shopping-cart-patent-and-saved-online-retail/ [https://perma.cc/XT6R-69HY].

95. Eduardo Porter, *Patent 'Trolls' Recede as Threat to Innovation. Will Justices Change That?*, N.Y. TIMES (Nov. 21, 2017), www.nytimes.com/2017/11/21/business/economy/patents-trolls-supreme-court.html [https://perma.cc/A55S-7B87].

96. *See About EFF*, ELECTRONIC FRONTIER FOUND., https://www.eff.org/about [https://perma.cc/SY34-5JPF] (last visited June 16, 2019).

97. Vera Ranieri & Thomas Fox, *Startup Won't Give in to Motivational Health Messaging's $35,000 Patent Demand*, ELECTRONIC FRONTIER FOUND. (Feb. 7, 2018), www.eff.org/deeplinks/2018/02/startup-wont-give-motivational-health-messagings-35000-patent-demand [https://perma.cc/B8TS-7YG3].

98. *Id.*

99. PERI HARTMAN ET AL., METHOD AND SYSTEM FOR PLACING A PURCHASE ORDER VIA A COMMUNICATIONS NETWORK (1999), https://patentimages.storage.googleapis.com/37/e6/81/3ebb1f33c41b4a/US5960411.pdf [https://perma.cc/TQK9-U32A].

100. Unlocking a Device by Performing Gestures on an Unlock Image, U.S. Patent No. 8,046,721 (filed June 2, 2009) (issued Oct. 25, 2011).

forth legal battles with Samsung from 2014 to 2017 ending with a big win for Apple in the U.S. Supreme Court.[101] Google and Uber have evolved from a mentorship relationship—Google was an early investor in Uber—to frenemies, since Uber bought Otto, an autonomous truck company started by a former Google engineer. Google has been working on its own autonomous fleet Waymo, which filed a lawsuit against Uber for collusion to steal trade secrets.[102] The time and money that go into protecting and defending intellectual property are resources diverted from research and development to build greater products.

Moreover, if a wealthy corporation sees a technology they want that already has a patent, they can just force the company out of business or buy them out. Being bought out might seem like a dream for many—coming up with an idea and then making millions because a major corporation took interest. But the truth is that in many cases it is not even a *choice*. The larger corporation likely has enough patents, a strong enough legal team, and an army of engineers to easily legally overtake the smaller corporation's innovation. Once the tool becomes property of the major corporation, they then can use it in whatever way they want, thereby limiting the possible outcomes to society and funneling the profits created from the innovation to themselves—the organization rich enough to gain control of it.

The United States used to fight against monopolies in order to increase innovation. In 1911, Standard Oil dissolved under the Sherman Antitrust Act of 1890,[103] which was put in place to make restraining trade and monopolizing commerce illegal.[104] The Supreme Court also broke up Bell Labs in 1984 and later went after Microsoft for having a monopoly on Internet browser software, which Microsoft won on appeal in 2001. On the surface level, this is when Microsoft proved that antitrust battles were no longer necessary in the swift and competitive digital market, after all, Google quickly rose to overpower Microsoft's Internet browser software. However, some point out that the lawsuit shook up Microsoft internally, making them less competitive and giving Google the opportunity to succeed. Antitrust lawyer Gary Reback argued in a *New York Times* interview that "[t]he internet only exists because we broke up AT&T," that "[t]he software industry exists because Johnson sued IBM," and that Microsoft's antitrust lawsuit made them less competitive.[105]

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101.   Jacob Kastrenakes, *Apple Has Finally Won $120 Million from Samsung in Slide-to-Unlock Patent Battle*, VERGE (Nov. 6, 2017), www.theverge.com/2017/11/6/16614038/apple-samsung-slide-to-unlock-supreme-court-120-million [https://perma.cc/UFA8-UU6P].

102.   Daisuke Wakabayashi, *Why Google's Bosses Became 'Unpumped' About Uber*, N.Y. TIMES (Feb. 7, 2018), https://www.nytimes.com/2018/02/07/technology/uber-waymo-lawsuit.html [https://perma.cc/6QYE-BWUU].

103.   *Standard Oil Company and Trust*, ENCYCLOPÆDIA BRITANNICA (Jan. 25, 2018), https://academic-eb-com.stanford.idm.oclc.org/levels/collegiate/article/Standard-Oil-Company-and-Trust/69396.

104.   *Sherman Antitrust Act*, ENCYCLOPÆDIA BRITANNICA (Dec. 9, 2016), https://academic-eb-com.stanford.idm.oclc.org/levels/collegiate/article/Sherman-Antitrust-Act/67322.

105.   Charles Duhigg, *The Case Google*, N.Y. TIMES (Feb. 20, 2018), www.nytimes.com/2018/02/20/magazine/the-case-against-google.html [https://perma.cc/8JZW-SDLE].

Not everyone has an equal opportunity to be rewarded for innovation from the outset. Many projects cannot get off the ground without proper investment. If the innovation is "successful," meaning something that can be highly profitable on the market, the investor—a wealthy person who did relatively little work on the project—will have the greatest profit to work ratio. The investors contribute little to no work on the innovation itself and invest with money they already have to make a large profit with minimal effort. Sure, they may risk that the company will fail, but it is not as if they choose who to fund indiscriminately. Investors look for companies that will succeed on the market and CEOs who they confidently believe will drive the team to success. The focus on high returns on investment undermines corporations that might have different primary values, like startups for social good. Focus on finding "the right" CEO also likely contributes to female CEOs finding less success than their male counterparts at fundraising.

Investors' profit-to-work ratios are generally followed by the founders', whose shares might not accurately reflect work invested but who at least are rewarded for their contributions to the original product. Later hired engineers stock options usually decline over time based on when they joined the corporation. An engineer who joins after the company is founded, but still works on building the integral product, likely will be offered stock, but not on the same scale as the founders or even the investors. Engineers who join highly profitable corporations typically receive salaries with minor vested stock options—meaning they must stay for a set amount of time (for example five years) to receive their full percentage of company stock. These later hires will be paid for working like any other job, even if they consistently directly contribute to the innovation or create new patents for the corporation—they might receive a raise or a bonus, but it is unlikely they will have the same returns on investment as the founders who made an equally small yet novel patent that started the company.

Even "free" technology is problematic. In prior generations, to benefit from modern innovation one did not need to sign away one's privacy and personal information. One did not need to agree to share ownership over one's socks and underwear to use a washing machine. There was a direct transaction of goods and services. If one went to a laundromat one would pay one's fee each time and be done. Any advertising would be circumstantial—*people who frequent laundromats might find Mr. Clean of interest*—and not target individual consumers.

Currently, "free" services that thrive on manipulating users are a marketable option for those who want to profit in the tech sector—so much so that users begin to demand and prefer free services without realizing the extent to which they are forgoing personal privacy, security, and freedom from persuasion. *Everyone is using the service so it must be secure and non-abusive, right? I have freewill, I can quit or join at any time.* Nir Eyal, the author of *Hooked: How to Build Habit-Forming Products*, wrote, "The technologies we use have turned into compulsions, if not full-fledged addictions . . . . [They] alter our everyday behavior, just as their designers intended.

Our actions have been engineered."[106] Facebook, Google, and Snapchat borrow their users' attention spans to sell them third-party products. This technology is neither innovative nor free, users are now the products for the ad agencies, Facebook's job has gone from connecting people to getting users to clock in to the social network for as long as possible. Moreover, user data can be used to run internal automated studies or build neural nets like DeepText, "Facebook's text understanding engine."[107]

There does not seem to be a direct correlation between wealth and innovation. The same companies that fiercely protect their own technology, fight to buy and use other corporations' work. This gives them the option to completely close down operations of the companies they purchase after deeming them not profitable under their business model. The innovation-to-reward ratio is completely unbalanced. Innovations are not rewarded based on overall impact to humanity but instead off of how wealthy those buying the technology are, how much they can take advantage of users, and how difficult they make their platform to iterate and borrow from.

It is believed that technologists deserve the resources they gain because of the innovations they create. What lays underneath are patent battles, purposely designed social media addictions, and poorly allocated returns on investment for societal and technological contributions. Innovation is not a valid excuse to give tech corporations an out for positively contributing to society and helping to reduce their negative outcomes, especially in the modern context when rewards for "innovation" are more entangled in capitalism than social progress.

B. Thank the Forefathers

The instigators of innovation are not proportionally rewarded for their efforts and "success," which depends more on the capitalist market than on positively impacting humanity; one might argue, however, that there is still a base of innovation that should continue to be rewarded and nurtured in the tech industry. It is a compelling thought that corporations lead the world toward progress, until one zooms out to recognize the history that made all of the current corporate tech wealth and innovation possible. In truth, everything is built from something else—the majority of modern groundbreaking technology's core elements derive from publicly funded academic and government research that were eventually added to the equally helpful open-source development community.

The coding languages that run most of today's technologies were not created by the companies that built them. Even exceptions to the rule, like Facebook's

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106.   NIR EYAL & RYAN HOOVER, HOOKED: HOW TO BUILD HABIT-FORMING PRODUCTS 1 (Portfolio/Penguin 2014).

107.   Ahmad Abdulkader et al., *Introducing DeepText: Facebook's Text Understanding Engine*, FACEBOOK CODE (June 1, 2016), https://code.facebook.com/posts/181565595577955/introducing -deeptext-facebook-s-text-understanding-engine [https://perma.cc/25DS-FVJ9].

JavaScript framework, ReactNative, and Apple's Swift, are iterations of previously released languages. Most software utilizes preexisting mathematical formulas and physics principles, just applied creatively to code. Even neural networks, the basis upon which artificial intelligence is built, are, at their core, applications of linear algebra, which use pre-collected data to allow a computer to "learn" something new. It takes creativity and experimentation to come up with the fastest, sleekest solution, but the innovation may often be something that others, if given access to the same preexisting knowledge, may be able to "discover."

In prior generations, neither those that invested in innovations nor those who created them expected to make such an extreme profit margin for their efforts. Moreover, their concentration was more focused on tools that would systemically change how humanity functions than add-ons to distract users and increase revenue. The computer, GPS, drones, Internet, and the first coding languages were all largely government and academically sponsored projects. They are also all tools that are used and combined in the present day to create lucrative systems that primarily benefit the well-off. Ironic, given that the technology would not be able to exist if the base tools were not made publicly available or subsidized by taxpayers.

Those who built the core frameworks used to run most modern technology never achieved the profit margins of current entrepreneurs that can build their platforms relatively quickly due to preexisting resources. Compare the lives of Steve Jobs and Dennis Ritchie. Dennis Ritchie was the main creator of the C programming language,[108] the language dictating how servers run the Internet and the derivatives of which enabled Apple, Microsoft, and Unix systems to be built.[109] Without Dennis Ritchie's contributions most modern technology would not be available in its current form. Conversely, Steve Jobs was more of a visionary than a technician, who succeeded in making sleek, easy-to-use personal devices available to the market by monetizing, privatizing, and iterating off of preexisting software. Jobs' death largely overshadowed Ritchie's, who died a week after the former Apple CEO passed.[110] Ritchie received rewards for his contributions to computer science, but never earned the wealth or public notoriety of those currently rewarded for technological innovation like Elon Musk, Mark Zuckerberg, Bill Gates, or Jeff Bezos—each billionaires.

As this Article is not on the history of computers, the core examples of this section are summarized in the following table constructed using *Encyclopedia*

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108. Posthumous tribute to Ritchie, elaborates on him being the "main designer" of the C Programming language and working on developing Unix in C. Steve Lohr, *Dennis Ritchie, 70, Dies; Trailblazer in Digital Era*, N.Y. TIMES, Oct. 14, 2011, at A22.

109. The C language led to the derivatives C++, C#, and Java. The Unix operating system went on to inspire the open source GNU-Linux system. Most TCP/IP Protocol is written in C. Apple runs on a Unix system, and Microsoft Windows' operating system was built primarily in C, C++, and C# with some assembly.

110. Cade Metz, *Dennis Ritchie: The Shoulders Steve Jobs Stood on*, WIRED (Oct. 13, 2011), www.wired.com/2011/10/thedennisritchieeffect/ [https://perma.cc/3Y59-2MV8].

Britannica's History of Computers.[111] The table consists of the year, individual, technology, and funding source that made possible many of the corporate innovations society rewards today. Important improvements in the private sector are also included. Many of the base tools highlighted were concurrently discovered in other parts of the world by those iterating off of globally available prior advancements. As this Article is primarily concerned with U.S. policy, U.S. contributions, which were arguably dominant due to a compulsion for military investment, are the focus.

Table 1: Brief History of Computers

Year	Lead Inventor	Innovation	Funding Source
1930	Vannevar Bush	First Modern Analog Computer (The Differential Analyzer)	MIT
1936	Alan Turning	Paper defining a universal computing machine, became a goal of academics	Cambridge University
1937	Howard Aiken	Fully Functional Computer (Mark I-IV)	Harvard, IBM
1939	John Vincent & Clifford E. Berry	Special Purpose Electronic Computer (ABC)	Iowa State University
1941	Konrad Zuse	First Program Controlled Processor (Z3)	German Government
1943	Sir Thomas Flowers	First Electronic Digital Computer (Colossus)	British Government
1943	John Mauchly & J. Presper Eckert, Jr.	Most Powerful Calculator to Date in 1943 (ENIAC)	U.S. Government, University of Pennsylvania
1948	Frederic C. Williams & Tom Kilburn	Simple Stored Computer (Baby), Later the first commercialized computer (Ferranti Mark I)	University of Manchester, British Government, Ferranti

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111. Paul A. Freiberger et al., *Computer*, ENCYCLOPÆDIA BRITANNICA (Jan. 30, 2019), https://www.britannica.com/technology/computer/History-of-computing [https://perma.cc/A943-7FTJ].

Year	Lead Inventor	Innovation	Funding Source
1949	Maurice Wilkes	First full-size, fully electronic, stored-program computer (EDSAC)	University of Cambridge
1949	John Mauchly & William Schmitt	Short code to make coding easier for human programmers (HLL)	Eckert–Mauchly Computer Corporation
1952	Heinz Rutishauser	Paper on foundation of how to build compilers, later worked on computer language AGOL	Institute for Applied Mathematics at ETH Zürich
1952	Alick Glennie	First implemented compiler (Autocode)	University of Manchester
1950s	Grace Hopper	Wrote compilers for BINAC and UNIVAC	Eckert–Mauchly Computer Corporation
1950s	John Backus	Wrote annotatable language FORTRAN and its compiler, making coding more accessible	IBM
1960	G.M. Amdahl, F.P. Brooks, & G.A. Blaauw	First commercially successful operating system that unified previously fractured tasks (IBM 360)	IBM
1961	Fernando Corbato & Robert Jano	Built first prototype for time sharing system that connected three separate users to a single IBM computer	MIT
1964	John Kemeny & Thomas Kurtz	Programming language to support time sharing and open programming to a larger user set (BASIC)	Dartmouth College
1965	GE	Time sharing focused operating system (Multics)	GE
	Ken Thompson & Dennis Ritchie	Time sharing operating system that supported piping — pushing one program result to another. The source	AT&T

Year	Lead Inventor	Innovation	Funding Source
		code was freely distributed to academic institutions (UNIX)	
1968	Douglas Englebart	Demonstration of using an online system with a mouse, keyboard, and windows display some of his many inventions	Stanford Research Institute
1969	DARPA	First communication network between government and 15 research institutions — origins of the Internet	U.S. Government, Multiple Universities
1970s	Xerox PARC	Alan Kay and Adele Goldberg detail paper describing a portable personal computer (Dynabook) Robert Metcalfe develops the ethernet. Researchers create a text editor that looks the same on the screen as it will when printed. Other innovations that were later commercialized by other corporations.	Xerox
1970s	MITS	DIY computer kit for Altair for $397, allowing people to build their own computers at home	Micro Instrumentation Telemetry Systems (MITS)
1970s	Bill Gates & Paul Allen	Programming language based off of BASIC that could run on MITS — Becomes Microsoft and licenses software to MITS	Microsoft
1976	Stephen Wozniak & Steven Jobs	First Apple computer — a printed circuit board, later implement features invented at PARC like the mouse and graphical user interface	Apple

Year	Lead Inventor	Innovation	Funding Source
1980	Bill Gates & Paul Allen	Partner with IBM to create an operating system and programming language for microcomputers (MS-DOS) IBM's first personal computer is named the PC built from parts not designed in house	IBM/Microsoft
1982	Compaq Computer Corporation	First of many IBM PC compatible personal computers, detracting from Apple and IBMs customer base	Compaq Computer Corporation
1990	Tim Berners-Lee	Made network information distribution easier — Easier to share information though the Internet	European Organization for Nuclear Research
1991	U.S. National Center for Supercomputing Applications, Urbana, Illinois	The Web Browser	U.S. National Center for Supercomputing Applications, Urbana, Illinois
1978-94	U.S. Government	Final Global Positioning System (GPS) sent into orbit in 1994, first launched in 1978, A total of 24 satellites make up the system	U.S. Government

The table contents are compiled from *Encyclopedia Britannica's* article on Computers.[112]

Either the past innovations that fertilized this current landscape were undervalued or current "innovation" is over rewarded—not adjusted for the power automation has to monopolize markets in a free market economy. Software did not magically appear in the twenty-first century. It was largely made possible by iterative government funding and university research that was then copied, built upon, and

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112. *Id.*

commercialized. This is not to say that current innovation should not be at all rewarded, it is just that the innovation itself cannot wholly be attributed to the corporation. In fact, a large part is luck and market timing—corporations like AskJeeves, a search engine that predated Google; LoudCloud, an early cloud computing service; and GO Corporation, a company that made a pre-palm pilot touch screen device that functioned like an iPad, failed simply because they were too innovative and ahead of their time. "Failed" corporations like these allowed future companies to thrive—learning from their mistakes and borrowing their successes.

There is an ironically named open-source web toolkit called Bootstrap.[113] Originally named "Twitter Blueprint," it was developed by Mark Otto and Jacob Thornton mid 2010 as an internal style guide.[114] The first version was released on August 19, 2011 after Twitter's first hack week caused the toolkit to explode as new developers jumped on the project.[115] Since then Bootstrap has become a ubiquitous tool among starting web developers. The name is ironic because none of the hundreds of thousands of designers who use it are, in essence, pulling themselves up by their bootstraps. In addition to the many other preexisting tools assisting them in making their site—HTML, the Internet, computers before that—these developers also incorporate Bootstrap to make their development even easier. This is not bad, it just serves as a metaphor for the tech industry as a whole—all innovations are an improvement from something else, all new inventions depend on external inspiration. Making "something new" is not enough to justify netting large profit margins without giving back when so much was given to allow creators success in the first place.

C. Picturing Valuable Innovation

We need a clear image of what valuable innovation looks like. Valuable innovation is work that goes toward raising the bottom standard of living and not increasing the distance between the bottom and top. Valuable innovation makes people self-actualize and does not take away from their productivity. Everyone stands to benefit from valuable innovation. Some persistent issues that would be valuable to fix include access to food, fresh water, healthcare, shelter, and education. Our billionaires can build rockets and flame throwers because we have systems that allow capital to conglomerate for those who can commercialize and iterate off of prior achievements.

The tools dedicated to societal uplift are currently the ones that receive the least financial support, while tools that make life more comfortable for those who can afford it can achieve the largest revenues. Valuable invention is discovering new

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113.   *See* BOOTSTRAP, https://getbootstrap.com [https://perma.cc/QW8E-CN6T].

114.   *About*, BOOTSTRAP, https://getbootstrap.com/docs/4.3/about/overview [https://perma.cc/DN84-3975].

115.   *Id.*

knowledge, harnessing it for social uplift, making a reasonable profit, and sharing it with the world—*not* forming new ideas, limiting who has access to iterate from them, and increasing economic disparity to hurriedly make 1000% return on investments. There are tech billionaires doubling efforts in space travel to "save humanity"—which is great—but it seems like more money and technological expertise is invested on escaping this planet than fixing it. Innovation needs to work toward fixing problems, not creating more, to have an inherent value.

There are companies that work to improve the world and determine success primarily through the fulfillment of their users and nonprofit margins. Propel is a service that assists individuals with managing their food stamp balance. Handup allows people to donate directly to verified homeless individuals. Wikipedia, despite its unpopularity with academics due to a lower reliability than thoroughly fact-checked un-editable sources, offers a non-predatory social good. The nonprofit encyclopedia has brought free information on almost any subject to people in over two hundred languages—if all the Wikipedia articles were printed as a book they would take up about eighty meters of shelf space.[116] There are other corporations as well, but they tend to be the minority. The problem is not so much that tech for good is difficult to try and pursue—countless for-profit schemes fail—but that the rewards for success are not as competitive. The belief that taxing tech corporations and breaking up monopolies hurts humanity by limiting innovation is a false rhetoric. Society does very little to encourage the kind of innovation that improves humanity by making the world a more livable, healthy, and equal place.

Lastly, sometimes the changes needed to improve the humanity are not technical but systematic, and, like the computer, require years of research and iteration. The smartest minds should be rewarded for their efforts to solve these issues, or at least have the revenue streams to try. There is a mental discontinuity between what society rewards people for producing and what the earth needs to be produced. Companies with profit mechanisms that depend on addicting users and or contributing to wealth imbalances have an obligation to assist in fixing the conditions they create. Profitable "innovation" is luck to be born at the right place in the right time, not an excuse to opt-out of responsibility for one's actions.

Conclusion: It is a myth that innovation has an inherent value—knowledge may be inherently valuable, but innovations put into practice must be judged based on their consequences. In the modern context, those most rewarded for innovation are not the originators of it, but, instead, those privileged and creative enough to maximize profit. Innovation is often hindered by patent trolls, large corporations buying out smaller ones, and profit margin centric investment. It is questionable that any innovation is solely the product

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116.   Lynn Neary, *Printing Wikipedia Would Take 1 Million Pages, but That's Sort of the Point*, NPR   (Mar. 30, 2014, 5:11 AM), www.npr.org/sections/alltechconsidered/2014/03/27/295262783/ printing-wikipedia-would-take-1-million-pages-but-thats-sort-of-the-point [https://perma.cc/R3FE-9ZGY].

of the originator as the current corporate landscape rests on a foundation of prior generations' publicly funded, open-source work. It is nonsensical to not hold companies responsible for creating damaging products when "innovation" itself lacks inherent value. The true heroes of innovation are the creators of tools to assist those most in need and provide open-source frameworks so that anyone—including private firms—can learn from and build off of what they create.

<div align="center">PART III – INFRASTRUCTURE</div>

There is a reason why tech companies flock to Silicon Valley. The Valley has become a pool of wealth and a symbol for innovation. Although it is well-known that the majority of startups fail, there is a general sense of open mindedness that even the wackiest of ideas can make billions of dollars as long as the right leader pushes them to succeed. San Francisco has transitioned from the gold rush city of immigrants and citizens alike coming to achieve the American Dream, to the start-up city of immigrants and citizens alike hoping to have their name among the ranks of Page, Jobs, Musk, and Zuckerberg. Brains, money, and legal support all conglomerate in the Valley.

Unfortunately, the growing presence of tech corporations has a visceral impact on the area as a whole, including those not involved in technology whose families may have lived in the Bay Area before it became *Silicon* Valley. It is estimated that for every one billion dollars invested in the Bay Area the price of "1-bedroom rents . . . increase $69 per month, and 2-bedroom rents . . . increase $99 per month."[117] Although this statistic found by Zumper, a tenet screening service, does not account for local zoning regulations and NIMBYs (homeowners who would rather increase the value on their property than increase economic diversity in their community) it still reflects a correlation to which the tech industry contributes. The cycle of continued investment in the Bay despite high living costs combined with the refusal to create more affordable housing help create the conundrum that despite being among the wealthiest regions in the United States, the Bay Area has one of the highest unsheltered homeless rates in the country.[118]

The tech industry cannot be blamed for preexisting conditions. Many young entrepreneurs do not start as homeowners and did not create the systematic privileges that helped them succeed, whether that be affirmation that someone who looks like them is capable of success, having a family that could provide them an education, early access to computers, or an enthusiastic circle willing to invest in their success. Yet, they are still responsible for the systematic injustices they perpetuate and intensify.

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117.   Andrew Duboff et al., *Are Venture Capitalists Raising Your Rent?*, ZUMPER BLOG (Oct. 21, 2015), www.zumper.com/blog/2015/09/are-venture-capitalists-raising-your-rent/ [https://perma.cc/8U53-XG2F].

118.   Molly Turner, *Homelessness in the Bay Area*, SPUR (Oct. 23, 2017), www.spur.org/publications/urbanist-article/2017-10-23/homelessness-bay-area [https://perma.cc/G8WH-NLFL].

A. Accessibility

One would hope that wealth generated for decades in the Bay Area would increase prosperity and employment opportunities for local residents. That is, money would be generated from taxes and spread to public schools, clinics, and shelters. Children could look around them see the jobs available and think "*ooh that could be me*" and pick up where the local tech visionaries leave off. This does not appear to be the case as black and Latino students consistently underperform in the Bay Area. In Santa Clara, one of the highest performing counties in the Bay Area, 27% of Latino students and 33% of African American students met or exceeded math standards as opposed to 83% of Asian students and 69% of white students.[119]

Meanwhile, according to a Joint Venture report, about "67% of 25-to-44-year-olds holding tech jobs are foreign-born" and for women in tech that number increases to 76%.[120] It seems that the same exclusionary privileges that allowed the founders of major tech corporations to thrive have persisted both locally and nationwide, so that in order to find both talent and diversity the tech industry must venture overseas. The vast majority of U.S. born citizens, especially women and people of color, are not provided with the resources or encouragement to make earning over $100,000 per year coding seem reasonably achievable.

Current company demographics follow this trend. A report combining records from over twenty major tech companies found that the average racial diversity break down in May 2018 was 54% white, 29% Asian, 7% Hispanic, and 5% black.[121] The report also included the average ratio of men to women in the tech industry of thirty-six women for every sixty-four men.[122] Unfortunately, these distributions are only more disproportionate when one focuses on engineering roles.

There is a lack of consensus on why there is an overrepresentation of white and Asian males in the tech industry and what should be done about it. One common argument is that there is a poor access pipeline for underrepresented demographics—corporations want to hire anyone with the appropriate skills yet there is not enough talent coming in to interview.[123] This argument is fair to an

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119.   Sharon Noguchi, *2017 California School Test Scores: Why Are They Flatlining*, MERCURY NEWS (Sept. 28, 2017), www.mercurynews.com/2017/09/27/california-school-test-scores-why-are-they-flatlining/ [https://perma.cc/5BFX-ZLJB].

120.   RACHEL MASSARO, 2017 SILICON VALLEY INDEX 8 (2017), https://jointventure.org/images/stories/pdf/index2017.pdf [https://perma.cc/X84Z-ZV7V].

121.   MIRIAM QUICK & STEPHANIE SMITH, EMPLOYEE DIVERSITY IN TECH, https://docs.google.com/spreadsheets/d/1e5jevLJTK9Aayob2msk4Ss9qIMCqfris4m_m0kXO-7s/edit#gid=1538486275 [https://perma.cc/AZP4-77VN].

122.   *Id.*

123.   Media companies are more frequently publishing op-eds referring to the pipeline issue as a myth for some of the same reasons that will be cited later in the paper. The magnitude of these pieces is representative of the heft of the excuse. As Intel Corporation's researcher Melissa Gregg writes in The Atlantic, "[t]ech industry leaders are constantly talking about the so-called 'pipeline problem.' On corporate stages and at academic conferences, CEOs and activists pledge their commitment to 'fixing the pipeline for STEM'—the acronym for science, technology, engineering, and math—by which they mean they want to get more young women and people of color into the coursework (and, ideally, the

extent, but also pushes the responsibility to support diversity from the corporation to the government. It also bypasses the fact that tech corporations have the power to influence the government—which is often used to support those tech corporations' own interests[124]—and have historically hired and advocated for "cultural fit" at their corporations.

"Cultural fit" epitomized the preferential atmosphere of the early insiders at corporations instead of what might be a more welcoming environment for outsiders. A common cultural fit test might have been an interviewer imagining how it might be to grab a beer with a candidate. This emphasis on cultural fit might explain why women were 45% more likely than their male counterparts to leave the tech industry after one year due to hostile work conditions.[125] Culture might also explain the series of female sexual harassment lawsuits being charged at tech companies.[126]

Fortunately, public pressure has pushed companies to re-evaluate their hiring process. Facebook has banned "cultural fit" terminology and created an optional internal bias training that nearly all of senior leadership completed.[127] These steps may have contributed to senior leadership increases from 3% to 5% for Hispanics and Latinos, 3% to 9% for blacks, and 27% to 29% for women within a year after the ban.[128] If just removing the concept of cultural fit and limiting internal biases could make that large of a shift in one year, imagine how much blockage to the so-called "pipeline" poor hiring ideology was creating in the first place.

Salary too lags behind what it should be for women, blacks, and Hispanics. A 2017 Glassdoor survey found that computer programmers have the highest adjusted

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internships) that will eventually turn them into attractive job candidates for tech companies." *See* Melissa Gregg, *The Deficiencies of Tech's 'Pipeline' Metaphor*, ATLANTIC (Dec. 3, 2015), www.theatlantic.com/business/archive/2015/12/pipeline-stem/418647 [https://perma.cc/7D6W-C3G5].

124.   Bloomberg News has a whole series dedicated to Silicon Valley's role in politics called *The Influence Game* covering topics. *See, e.g.*, Ben Brody et al., *Big Tech Stages White House Lobbying Blitz: The Influence Game*, BLOOMBERG: QUINT (Feb. 16, 2018), https://www.bloombergquint.com/technology/2018/02/16/big-tech-stages-white-house-lobbying-blitz-the-influence-game [https://perma.cc/DS4D-3MMQ] (last updated Feb. 27, 2018) (describing tech leaders advising President Trump); Olivia Zalesk, *Airbnb's Early Lobbying Led to a Win in Cuba: The Influence Game*, BLOOMBERG: QUINT (Feb. 15, 2018), https://www.bloomberg.com/news/articles/2018-02-15/airbnb-s-early-lobbying-led-to-a-win-in-cuba-the-influence-game [https://perma.cc/6RYM-SJNL] (describing Airbnb lobbying to have access to the Cuban market).

125.   Sylvia Ann Hewlett, *What's Holding Women Back in Science and Technology Industries*, HARV. BUS. REV. (Nov. 2, 2014), https://hbr.org/2014/03/whats-holding-women-back-in-science-and-technology-industries [https://perma.cc/QP5N-STT4].

126.   Several tech corporations have had public sexual harassment incidents. An overview of some can be found here: Patrick May, *Silicon Valley Figures Get Swept up in the Unfolding Sexual-Harassment Crisis*, MERCURY NEWS (Dec. 7, 2017), www.mercurynews.com/2017/12/06/silicon-valley-figures-get-swept-up-in-the-unfolding-sexual-harassment-crisis [https://perma.cc/T6AF-B7AF].

127.   Lars Schmidt, *The End of Culture Fit*, FORBES MAG. (Mar. 28, 2017), www.forbes.com/sites/larsschmidt/2017/03/21/the-end-of-culture-fit/#6e766e40638a [https://perma.cc/9W3G-3EQ2].

128.   *Id.*

gender gaps between men and women at 28.3%.[129] Meanwhile, Stanford doctoral student June Park John, along with Economics Professor Martin Carnoy, published a paper finding that a race gap continues in computer science for all minorities, including Asian males, who are generally underpaid and less likely to be promoted to managerial positions than their white counterparts.[130] The study also found that while fewer white females are pursuing degrees in computer science, more Hispanic males have earned degrees, but their representation in the industry has declined.[131] The paper suggests, "Policies designed to attract white females may need to focus on getting white females to major in computer science, while policies designed to attract Hispanic males may focus on applying to jobs or convincing employers to hire more Hispanics with CS degrees."[132]

Regardless of the pipeline to the wage discrimination problem, tech corporations maintain data on whether or not employees in the same position earn the same salary.[133] To reward those who have been societally advantaged and demand higher pay without being objectively superior weakens the diversity pipeline for future generations. Corporations should be transparent about employees' wages or at least continually adjust pay so that it reflects their work and value to the company, not just a doggedness to make more money than their peers. The pipeline of women and minorities may be weak, but tech corporations are not effectively handling the valuable resources that come out. While none of this may be intentional harm, it still leaves an impact.

Unfortunately, the higher one climbs the leadership ladder, the less accessible success becomes. It goes as deep as to who can be seen as capable of leading a company. Female founders generally struggle to access as much funding as their male counterparts.[134] Investment-level venture capitalists, the driving financial force behind Silicon Valley, are 89% male[135] and tend to look for patterns in CEOs. While attempting to find the next Zuckerberg, who, for reasons outlined earlier, may have had more advantages to reach his success, venture capitalists may miss out on equally talented potential without the same *look*.

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129.   ANDREW CHAMBERLAIN, DEMYSTIFYING THE GENDER PAY GAP: EVIDENCE FROM GLASSDOOR SALARY DATA 24 (2016), https://www.glassdoor.com/research/studies/gender-pay-gap [https://perma.cc/C9VX-YYJT].

130.   JUNE PARK JOHN & MARTIN CARNOY, RACE AND GENDER TRENDS IN COMPUTER SCIENCE IN THE SILICON VALLEY FROM 1980–2015, at 16 (2017), https://cepa.stanford.edu/sites/default/files/JohnCarnoy_Sept2017.pdf [https://perma.cc/6XYL-7MXF].

131.   *Id.*

132.   *Id.*

133.   Corporations store data on employee salaries in order to pay their employees and calculate raises and bonuses. Corporations also track the positions of each employee. Therefore, the relationship between salary and position can be linked by position.

134.   Gené Teare, *It's 2017, and Women Still Aren't Being Funded Equally*, CRUNCHBASE NEWS (July 14, 2017), https://news.crunchbase.com/news/2017-women-still-arent-funded-equally [https://perma.cc/RUL3-WX8C].

135.   CHRISTIE SMITH ET AL., NVCA-DELOITTE HUMAN CAPITAL SURVEY REPORT 6 (2017), https://nvca.org/wp-content/uploads/delightful-downloads/2016/12/NVCA-Deloitte-Human-Capital-Survey.pdf [https://perma.cc/CA52-E3T6].

Fortunately, there are groups like Street Code, Girls Who Code, and Code 2040 that bring free specialized resources to those who otherwise would not have the opportunity to learn software engineering or have difficulty figuring out how to get hired. Some corporations claim to be shaking up hiring processes, how they recruit, and company culture—others are increasing internal wage checks and diversity efforts.[136] Where people went to school might mean less than their prior accomplishments. There are coding boot camps for adults that one has to pay for only if one is hired.[137] While these actions may sound revolutionary, they should be baseline principles, because these privileges were long granted to those who fit the traditional "tech bro" stereotype. Through no fault of his own, the former tech bro could be recruited at his university, swayed to join a company through his insider network, taught how to code by a friend, or be regarded seriously after not attending or dropping out of college.

Ironically, there is a surprising tech group that feels marginalized and is starting to speak out. These are conservative and libertarian white men. While fighting a gender pay lawsuit, Google simultaneously faced a lawsuit from James Damore who was fired for his infamous internal memo "Google's Ideological Echo Chamber: How Bias Clouds Our Thinking About Diversity and Inclusion."[138] His memo argued that Google was leftist biased, often ignoring biological differences between men and women and effectively promoting hiring discrimination, while silencing those with more nuanced conservative leaning views.[139] CNN Tech covered the story and included interviews from several libertarian and conservative white men. One warned, "If I walked into work with a 'Make America Great Again' hat there would be repercussions. People would take it as a personal affront. I would expect to be out of the company within weeks if not a month."[140]

James Damore's lawyer for his suit, Attorney Harmeet Dhillon, a member of the Republican National Committee (RNC), thinks "conservatives are the underdog in Silicon Valley." She remarks, "If you're a young man in your twenties, and you're

136.   In October 2016, recruiting service, Socialtalent, published a blog post on methods six companies are using to improve their diversity. *See* Siofra Pratt, *6 Companies Doing Their Bit to Improve   Diversity & Inclusion*, SOCIALTALENT (Oct. 5, 2016), https://www.socialtalent.com/blog/recruitment/6-companies-doing-their-bit-to-improve-diversity-inclusion [https://perma.cc/9VPA-SWW6].

137.   Blogger, Harry Hantel includes seven completely free coding bootcamps and nine deferred payment bootcamps in "*Learn to Code at These Free Bootcamps*." To learn more visit: https://www.coursereport.com/blog/best-free-bootcamp-options [https://perma.cc/LY36-T3WX].

138.   *See* Alyssa Newcomb & Jo Ling Kent, *Google Hit with a Gender Pay Discrimination Lawsuit*, NBC NEWS (Sept. 15, 2017), www.nbcnews.com/tech/tech-news/google-hit-gender-pay-discrimination-lawsuit-n801396 [https://perma.cc/QZ2G-38DF].

139.   Memorandum from James Damore, *Google's Ideological Echo Chamber: How   Bias   Clouds   Our   Thinking About Diversity and Inclusion* (July 2017), https://www.documentcloud.org/documents/3914586-Googles-Ideological-Echo-Chamber.html [https://perma.cc/6WNF-ZML3].

140.   Sara Ashley O'Brien, *Engineers Sue Google for Allegedly Discriminating Against White Men and Conservatives*, CNNMONEY (Jan. 8, 2018, 5:53 PM), money.cnn.com/2018/01/08/technology/james-damore-google-lawsuit/index.html [https://perma.cc/NXW4-643A].

making a quarter million dollar[s] with your salary and your bonus and your stock . . . do you want to be the martyr of conservative rights . . . by saying '. . . I've been discriminated against' and tank the next 20 to 30 years of your earning capacity?"[141] Given that women, people of color, and the LGBTQ community have historically been held back from self-advocacy in corporations, it seems hard to know exactly who these white men are fighting against or why they feel so victimized by their corporations.

The numbers seem hypocritical for underdog status—as of 2018, 21.4% of Google's tech workers were female, 2.8% Hispanic, and 1.5% black.[142] Meanwhile, Aaron Ginn, an outspoken tech conservative and leader of the Lincoln Group, estimates that 10−25% of Silicon Valley tech employees are not only conservative but voted for Trump[143] —in other words, a group currently represented by the executive branch feels silenced while having greater numbers than most minority groups. Interestingly, a common argument for a stronger conservative voice at tech corporations is the value that diversity brings to build tools reflective of the world, yet many closeted conservatives view diversity-minded hiring practices as discriminatory.

While it may be true that just hiring to reach a quota is not useful to the company or those who earned their credentials and do not want to be seen as sympathy hires, that argument misses the point that diversity has an inherent value. If a company was building a technology for the colorblind and did not have a single colorblind person on its team, they would be disadvantaged even if they had the most technically savvy group. Even if the colorblind person was not the world's strongest coder, she would help prevent major pitfalls. Silicon Valley's technology is being deployed to the world. It is to each company's advantage to reflect that.

James Damore's firing likely caused more harm than good, but his argument deserved debate given that he was not alone in his way of thinking—others at Google agreed with Damore's sentiment that "conservatives are a minority that feel like they need to stay in the closet to avoid open hostility."[144] Several members of the company even assisted in the several rounds of editing that occurred before the memo went viral.[145] Some of the memo's more nuanced suggestions included making programming more female friendly and fostering greater flexibility of the male gender role.[146]

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141.   *Id.*
142.   DANIELLE BROWN, GOOGLE DIVERSITY ANNUAL REPORT 18 (2018), https://static.googleusercontent.com/media/diversity.google/en//static/pdf/Google_Diversity_annual_report_2018.pdf [https://perma.cc/8JA8-YJDW].
143.   O'Brien, *supra* note 140.
144.   Damore, *supra* note 139, at 8.
145.   The class action lawsuit, *Damore v. Google, LLC*, which is publicly available online, states, "Multiple employees made suggestions and provided feedback, and this memo was edited multiple times." Complaint at 8, *Damore v. Google, LLC*, No. 18CV321529 (Cal. Super. Ct. Jan. 8, 2018).
146.   Damore, *supra* note 139, at 5.

The sad hypocrisy was that Damore wanted to silence diversity groups for being "discriminating," "highly politicized," and "alienat[ing of] non-progressives" while arguing that Google "should empower those with different ideologies to be able to express themselves."[147] In truth, the conservatives of Silicon Valley and the historically unprivileged have the same goals—the ability to be hired, fit in, speak their minds, and have teams that reflect the diversity of those who will be using their products. One group, however, is still quantifiably marginalized for identities they were born into and cannot hide, while the other feels ostracized by having to suppress political opinions that may further marginalize the statistically oppressed.

B. *Locality*

Tech corporations do not live in a vacuum. Employees use the same roads as residents and occupy the same land, while at the same time eating in their own subsidized food courts and, in some instances, like Facebook and Google, riding in the company-sponsored commuter bus system (which allows employees to price people out of affordable neighborhoods and still enjoy a comfortable journey to work). Corporations buy the land easiest to afford and develop. Engineers increase their personal revenue by relocating to the most affordable housing closest to the office. Homeowners maximize profit by evicting poor tenants and preventing shelters from being built in their area, because the "poor" who were previously just normal neighbors seem unpalatable in the face of newfound wealth. This leaves nowhere for those with newfound poverty—remember wealth is relative—to go, besides moving in with neighbors, into trailers, or on to the street.

Instead of managing their own community impact, tech corporations move it along by ignoring their role in the equation. The structure of tech companies allows them to generate revenue internationally with an ease not possible in prior generations and to concentrate that wealth amongst few individuals. Surplus revenue can go to feeding employees, providing unlimited vacation, transportation services, housing subsidies, healthcare, and gyms—basically corporate socialism for some of the highest paid individuals in society. These tactics disincentivize workers from leaving their offices and investing dollars in their local community. When corporations fulfill all basic needs, employees can move into predominately low-income communities and never need to interact with their neighbors. Essentially, the money generated from the company remains isolated from the community in which it installs itself—with the exception of wealthy homeowners, who may not even live in the area.

Sadly, this is harmful for tech corporations as well. Teachers can hardly afford to live in the same communities as their students.[148] And the same is true for general

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    147.   *Id.* at 8–9.

    148.   In August 2017, CBS SF Bay Area reported on an adjunct professor at San Jose State that lived out of her car with her dog and partner. She is just one of many who have been featured on such reports. *Homeless San Jose State Professor Struggles Living Out of Her Car*, CBS SF BAY AREA (Aug. 30,

U.C. IRVINE LAW REVIEW [Vol. 9:1063]

service workers like restaurant workers, security personnel, and janitors. It was found in 2017 that a $105,000 salary qualified as low income for a family of four in San Francisco and San Mateo.[149] According to data for 2014, in the United States $100,000 was in the top 8% of salaries[150] and on the low side of average for a tech worker in Silicon Valley. Given the high cost of living, it becomes understandable that tech corporations offer so many benefits to their employees, including housing stipends for the same apartments that those with lower, non-housing-subsidized incomes struggle to keep. Unfortunately, the cycle of only looking out for the engineers ends up hurting communities as a whole. Housing prices rise and the area grows less economically and racially diverse, as only those advantaged enough to survive the tech pipeline can afford to live in the community.

The cost of living has gone above being too high for those who depend solely on welfare. Rather, it has become too high for even tech workers to dream of owning homes, saving for retirement, and starting a family. Individuals making well above $50,000 per year crowd into shared apartments, paying over $1000 per month for a single room. Families making below that may all live in one room together, live in a trailer, spend the majority of their income on rent, or try to make enough money to leave and set roots elsewhere.

Tech workers in Silicon Valley feel like they work hard, but a high portion of their salary goes to living expenses. Meanwhile, local families struggle as they become outsiders to increasingly expensive neighborhoods. It is hard to say who wins in such a situation, beside homeowners and corporations. Last year it was estimated, in comparison to their market value, that one in three tech workers were actually 10% underpaid.[151] This is because of the growing demand for engineers, the return on investment for automation, and the latency of tech corporations to increase salary for longtime employees up to the market value. Corporations try to keep employees comfortable and satiated, hoping that they stay loyal instead of pursuing personal goals. As mentioned in Part II, companies may offer vested company stock in lieu of increased compensation as a strategy to keep employees longer. Often it takes at least five years to receive the full allocation of company stock.

Of course, this strategy is good in some ways—ideally everyone could have access to promising stock options, free food, and healthcare. It is just unfortunate

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2017, 6:58 PM), https://sanfrancisco.cbslocal.com/2017/08/30/homeless-san-jose-state-professor-struggles-living-out-of-her-car [https://perma.cc/RN98-M39H].

149. *FY 2018 Income Limits Summary*, HUD USER: FY 2018 INCOME LIMITS DOCUMENTATION SYSTEM (2018), www.huduser.gov/portal/datasets/il/il2017/2017summary.odn [https://perma.cc/4CBX-PJ3G].

150. Andrew Van Dam, *What Percent Are You?*, WALL STREET J. (Mar. 2, 2016), https://graphics.wsj.com/what-percent [https://perma.cc/CVA9-HLGZ].

151. Lauren Weber, *One in Three Tech Workers Is Underpaid*, WALL STREET J. (Jan. 10, 2017), www.wsj.com/articles/one-in-three-tech-workers-is-underpaid-1484060402 [https://perma.cc/DT 5M-4QQZ]; *see* Catherine R. Albiston & Laura Beth Nielsen, *Welfare Queens and Other Fairy Tales: Welfare Reform and Unconstitutional Reproductive Controls*, 38 HOW. L.J. 473 (1994).

that a few corporations can operate as mini oases, making the surrounding communities poorer by proximity, and, in the process, hurting the employees they wish to protect. Ideally, the wealth of corporations would uplift local community and not just drive people out. Fortunately, there are a few legal structures in place to mitigate the negative influence corporations have on the communities they move into, one of which is called "impact fees." The San Francisco Planning website explains, "The City imposes development impact fees on development projects in order to mitigate the impacts caused by new development on public services, infrastructure and facilities"—for example, improving public transport to counteract the added burden on the system.[152]

The difficulty is to estimate a corporation's financial burden, have the local government receive that full amount in funding, and apply those fees in a way that adequately addresses impact. If money given to the government directly assisted those made homeless from landlord evictions and rising rents, and local employees earned higher incomes from an influx of wealth surging through the community, then tech presence would be a win-win for all involved. This, however, is not how the incentive structures usually work out. City governments actually stand to benefit from community gentrification and increased tax revenue from high income earners, causing them to fear asking too much and risk the corporation finding a different location.

Wealthy cities mean higher tourism rates. Fewer poor people means less government funding needed for social safety nets. Governments—unless they are formed by sympathetic altruists—are disincentivized from spending impact fees in a way that directly counteracts the negative impact of new corporations. In the long-term, it might seem better to let the old wave of citizens go than to waste corporate fees on building low-income housing to keep people in the gentrifying neighborhood.

In 2012, East Palo Alto was trying to determine what sort of impact fees to request of Facebook. As a community lawyer at Community Legal Services in East Palo Alto described, "In 2011, 2012 [Facebook's] position was [that they are] not to blame for the housing crisis [and that they] have no role in helping to fix it. [They thought that it] is not [their] problem."[153] In short, Facebook wanted nothing to do with alleviating the housing crises primarily because they felt it was not their responsibility. During this time, BAE Urban Economics estimated that Menlo Park should charge Facebook $8.6 million in fees to distribute among impacted areas.[154] This impact fee for the relocation of Facebook headquarters amounted to about

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152.   To read more on San Francisco's impact fees, visit http://sf-planning.org/impact-fees [https://perma.cc/B5BW-RPWR].

153.   Telephone Interview with anonymous nonprofit lawyer (Fall 2017).

154.   BAE URB. ECONS., FISCAL IMPACT ANALYSIS OF PROPOSED FACEBOOK PROJECT (Apr. 6, 2012), www.menlopark.org/DocumentCenter/View/2344 [https://perma.cc/NV4D-4MZJ].

0.01% of the corporation's estimated net worth at the time.[155] Several East Palo Alto community leaders noted that $8.6 million would be nowhere near enough to subsidize and build low-income housing to the extent at which the new headquarters would cause displacement.

According to the community lawyer, after a few years of negotiations with Facebook's C-Suite team, "there was some sense that 'hey we actually all want there to be some solution to this housing crisis.' And as part of those conversations [they] were able to negotiate a benefits agreement whereby Facebook agreed to pay approximately . . . [an] additional [$]20 million of community benefits."[156] The lawyer describes executives' perspectives changing to "It's not *all* our fault. We didn't start this crisis, but we understand that we are a part of it and that we contribute to it in certain ways."

The conditions in the Bay Area cannot afford to worsen when "one in 11 children live in poverty . . . [and 29%] of the region's households do not earn enough money to meet their basic needs without public or private, informal assistance," which "jumps up to 59% for . . . Hispanic or Latino householders."[157] In January 2018, a United Nations rapporteur visited San Francisco and Oakland to assess living conditions for the homeless and expressed that, "there's a cruelty here that I don't think I've seen."[158] She believed that if the numbers of those on the street were hovering around 100 instead of 7,500 it might be attributable to individual choices, "but when you're seeing the numbers of people who are homeless here and in every other city, you just know it's structural."[159]

C. World Wide

Due to the clone-able nature of digital technology, its reach spans far beyond the corporation that created it or the community in which it is situated. The Internet allows for quick, cheap globalization. A company can locate its offices in areas of the most financial convenience so that as little revenue as possible is lost on its way back to the corporation. This gives tech corporations control over foreign markets in a way that was not possible years ago. Previously, items had to be transported abroad, which would employ shipping crews and may involve import and export fees. If the transportation prices were too cumbersome, then the company would have to make local branches which would employ and distribute money to foreign workers. The difficulty in maintaining dominance in a foreign market might give

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155. Facebook was estimated to be worth over $82 billion in February 2012. Dealbook, *Tracking Facebook's Valuation*, N.Y. TIMES (Feb. 1, 2012), http://dealbook.nytimes.com/2012/02/01/tracking-facebooks-valuation [https://perma.cc/LN5P-ADWB].

156. Telephone Interview with anonymous nonprofit lawyer (Fall 2017).

157. MASSARO, *supra* note 120, at 9.

158. Alastair Gee, *San Francisco or Mumbai? UN Envoy Encounters Homeless Life in California*, GUARDIAN (Jan. 22, 2018), http://www.theguardian.com/us-news/2018/jan/22/un-rapporteur-homeless-san-francisco-california [https://perma.cc/6VKP-38XG].

159. *Id.*

other countries an opportunity to make their own versions of the product, thus increasing competition and pushing innovation to best meet consumer needs.

In the current system, tech corporations can saturate markets by providing "free" services over the Internet. Foreign offices may be built, but there is a much lower incentive to create factories or hire engineers to work internationally since software can so easily be distributed worldwide from any given location. Foreign offices may serve more as community liaisons, less to change the core product and more to market and tweak the tool so that it is viable in the community. The foreign offices might more commonly exist to ensure culturally appropriate market reach and design than employing a large number of engineers at similar rates as the main headquarters.

One exception to Silicon Valley's influence on the global stage is China, which, thanks to the "Great Fire Wall," has experienced large financial growth in the tech sector. China has purposely slowed or blocked foreign social media and productivity sites including Facebook, Instagram, Google, and WhatsApp (although Instagram and WhatsApp are both owned by Facebook, they are worth mentioning separately as they operate differently and have distinct privacy measures).[160] Due to the fact that China has developed its own network of similar applications, it seems clear that the main reason for blocking these sites was not to prevent the negative effects of social media on mental health or to increase citizen privacy. Recent and ongoing events suggest that the primary concern was that the Chinese government could not control or intercept content on foreign owned entities.

The Chinese government pressured Google to take down over two thousand items in the first half of 2017, even though Google is largely unavailable without a VPN in China.[161] Additionally, that same year, a Chinese anti-terrorism expert called for the removal of tweets that "defame the party, Chinese leaders, and related national strategies."[162] Despite Zuckerberg studying Mandarin, meeting with Chinese government leaders, and building an internal secret app that would allow a third party (such as the Chinese government) to prevent certain news from

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160.   WhatsApp offers automatic end-to-end encryption of messages, meaning that the company does not have access to peoples' messages as they are stored on the phone's memory, or, if the user chooses, up to Google Drive. *See* WHATSAPP SECURITY, https://www.whatsapp.com/security [https://perma.cc/5MYC-HDCT]. Instagram, however, stores all uploaded content and messages on a server which is accessible by the corporation. Per Instagram's April 2018 Data Policy, Instagram "collect[s] the content, communications and other information you provide when you use our Products, including when you sign up for an account, create or share content, and message or communicate with others." INSTAGRAM DATA POLICY, https://help.instagram.com/519522125107875 [https://perma.cc/VQM5-JGTL].

161.   Paul Mozur, *China Presses Its Internet Censorship Efforts Across the Globe*, N.Y. TIMES (Mar. 2, 2018), https://www.nytimes.com/2018/03/02/technology/china-technology-censorship-borders-expansion.html [https://perma.cc/D7GC-XJP6].

162.   *Id.*

appearing on regional users feeds,[163] China has grown increasingly disinterested in compromise, leaving Zuckerberg and others frustrated to find their next billion users.

Instead, the Chinese government actively supports nationally created products that they fully control. China has its own search engine (Baidu), its own video sharing service (Youku Tudou), its own social networks (Weibo and Ren Ren), its own restaurant rating service (Dianping), its own ride sharing service (Didi Chuxing), and more. These platforms all function under government surveillance and were largely created chronologically after and inspired by their blocked Western equivalents. China paints a different picture of a tech-centric future, one that openly profits from government market manipulation and censorship. Meanwhile, Silicon Valley seems to quietly profit by independent corporations manipulating and controlling users under the guise of individual freedom with the support of a fairly ambivalent government.

Meanwhile, the European Union (EU) has been fighting to bring control back to the individuals who use technology and force corporations to see the humanity in their "users."[164] Some of the highest earning U.S. Internet companies have found themselves peppered with lawsuits to protect human rights.[165] The right to be forgotten—more accurately the right to not have your past appear on commercial search engines—was won in the European Union in a 2014 case against Google before the European Court of Justice.[166] Initially Google only wanted to remove links from the country in which requests were made, but it finally conceded to blocking approved requests in all EU domains—google.fr, google.de, for example—while keeping URLs searchable in non-European countries.[167] Although,

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163.   Mike Isaac, *Facebook Said to Create Censorship Tool to Get Back into China*, N.Y. TIMES (Nov. 22, 2016), www.nytimes.com/2016/11/22/technology/facebook-censorship-tool-china.html [https://perma.cc/A54U-CP6Z].

164.   One such example is the General Data Protection Regulation (GDPR), an EU level data protection law, which has forced tech companies to internally change operation standards and data storage. This was a frequent topic at the 2018 Grace Hopper Conference for Women in Computer Science, which I attended. *See* LUXEMBOURG PUB. OFF. OF THE EUR. UNION, EU DATA PROTECTION REFORM: BETTER DATA PROTECTION RIGHTS FOR EUROPEAN CITIZENS 1 (2018), https://ec.europa.eu/commission/sites/beta-political/files/data-protection-factsheet-citizens_en_1.pdf [https://perma.cc/3CHX-FFYU] ("Your right to protect your personal data is something which must be safeguarded. There are numerous potential risks, such as unauthorised disclosure, identity theft or online abuse, to name a few. Protection of personal data is a fundamental right for everyone in the EU.").

165.   *See* Mark Scott, *Antitrust and Other Inquiries in Europe Target U.S. Tech Giants*, N.Y. TIMES (Dec. 21, 2017), http://www.nytimes.com/2015/04/03/technology/europe-regulators-apple-google-facebook.html [https://perma.cc/GME4-R9RH].

166.   Foo Yun Chee, *European Court Says Google Must Respect "Right to Be Forgotten,"* REUTERS (May 13, 2014), https://www.reuters.com/article/us-eu-google-dataprotection/european-court-says-google-must-respect-right-to-be-forgotten-idUSBREA4C07120140513 [https://perma.cc/3BXP-J6PX].

167.   *French Court Refers 'Right to Be Forgotten' Dispute to Top EU Court*, REUTERS (July 19, 2017), https://www.reuters.com/article/us-google-litigation/french-court-refers-right-to-

the law only applies to commercial search engines links that "are inadequate, irrelevant or no longer relevant, or excessive" and not to the removal of content itself, Google is thought to be protected from sharing this feature with American citizens due to freedom of speech, even though the corporation already censors copyrighted and personal information.[168]

Since May 2014, Google has received 2.43 million URL takedown requests and removed a little under half.[169] Yet the right to be forgotten is only a slice of the Internet company's European woes. Google currently faces an antitrust lawsuit after deciding to fight the record breaking $2.7 billion fine charged by the EU for selling sponsored products straight from its search engine instead of ranking them by popularity or price.[170] Essentially, the algorithm does not give a fair shot to competitors because sponsored products always show up first. Google's system was differentiated by the EU Commission from other price comparison services like Amazon because all products on Amazon's site have a deal with Amazon and are ranked by factors other than sponsorship.

However, Google has purposely under-ranked competitors for years. In 2006, Google released its Big Daddy update, which "penalized websites with large numbers of subpages but few inbound links," and soon after added Panda, which "penalized sites that copied text from other websites."[171] This was done under the guise of undermining "individuals or systems seeking to 'game' [their] systems in order to appear higher in search results—using low-quality 'content farms,' hidden text and other deceptive practices."[172] Left from the narrative was that pages with many links that were not frequently linked from other sites and have text from other websites are core features of Google and therefore competitor search engines.

Apple is currently fighting alongside Ireland to repeal an EU fine for tax evasion in Ireland.[173] Apple had worked out a deal to pay 50 euros in taxes for every million euros in profit—a compromise that Ireland was fine with, having experienced a 26.3% per year increase in economic growth by incorporating policies

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be-forgotten-dispute-to-top-eu-court-idUSKBN1A41AS   [https://perma.cc/UV2T-CA5A] (describing a current French court case seeking to have content delisted internationally).

168.   Farhad Manjoo, *'Right to Be Forgotten' Online Could Spread*, N.Y. TIMES (Aug. 5, 2015), http://www.nytimes.com/2015/08/06/technology/personaltech/right-to-be-forgotten-online-is-poised-to-spread.html [https://perma.cc/6HCN-NBVG].

169.   James Doubek, *Google Has Received 650,000 'Right to Be Forgotten' Requests Since 2014*, NPR   (Feb. 28, 2018), http://www.npr.org/sections/thetwo-way/2018/02/28/589411543/google-received-650-000-right-to-be-forgotten-requests-since-2014 [https://perma.cc/G47G-BJ7J].

170.   Mark Scott, *Google Fined Record $2.7 Billion in E.U. Antitrust Ruling*, N.Y. TIMES (June 27, 2017), http://www.nytimes.com/2017/06/27/technology/eu-google-fine.html [https://perma.cc/ZC5V-AX5G].

171.   Duhigg, *supra* note 105.

172.   *Id.*

173.   James Kanter & Mark Scott, *Apple Owes $14.5 Billion in Back Taxes to Ireland, E.U. Says*, N.Y. TIMES (Aug. 30, 2016), http://www.nytimes.com/2016/08/31/technology/apple-tax-eu-ireland.html [https://perma.cc/FTT2-2VKB] ("Ireland and Apple both said they intended to fight Europe's decision, even though any appeals process could take years.").

that benefit corporations.[174] The EU is demanding for Ireland to receive 13 billion euros of lost tax revenue plus interest.[175] In the midst of the Irish investigation, Apple began to look for alternative locations to store revenue. In 2017, the Paradise papers leak revealed that Apple stored $252 billion in Jersey, a channel island between England and France with a "0% corporate tax rate for foreign companies."[176]

Before one feels too guilty for the government bullying of tech corporations, it is useful to put their wealth in perspective. In July 2017, CNN Money estimated the net worth of Apple ($798 billion), Google ($667 billion), Microsoft ($571 billion), Facebook ($500 billion) and Amazon ($500 billion).[177] These estimates would make them the 31st, 35th, 38th, and 42nd wealthiest countries respectively in terms of GDP[178] —ahead of Norway (49th), Ireland (52nd), and Qatar (53rd). While the EU and China might have the resources to negotiate technology's impact on their own terms, one must wonder what it is like for a smaller nation to stand up to a superpower like Alphabet or Facebook. While countries may be able to exercise the right to block or ban, they might lack the resources to enforce it or the ability to offer their citizens alternatives to the benchmark platforms the rest of the world uses.

Comparing the CNN Money net worth estimates to each company's most recent 10K Securities and Exchange Commission (SEC) filing report, employee count reveals that if shares were equally distributed amongst full-time employees at Apple, Google, Microsoft, Facebook, and Amazon, each worker would range from almost a millionaire to a multi-millionaire. This range is greater than the highest GDP per capita country, Liechtenstein, at $139,000.[179] Comparing the results of the average wealth per employee at Apple, Google, and Microsoft ($6.2 million), to that of retail giant Walmart ($0.1 million), one finds that the tech worker is "worth" sixty-two times more than an average Walmart retail employee.[180] Given that the average software engineer gets paid nowhere near sixty-two times the minimum wage, one must wonder where all the extra money goes and why people assume

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174.   *Id.*

175.   *Id.*

176.   Paradise Papers Reporting Team, Paradise Papers: Apple's Secret Tax Bolthole Revealed, BBC (Nov. 6, 2017), http://www.bbc.com/news/world-us-canada-41889787 [https://perma.cc/4N6T-WL5V].

177.   Matt Egan, *Facebook and Amazon Hit $500 billion milestone*, CNN MONEY (July 27, 2017), https://money.cnn.com/2017/07/27/investing/facebook-amazon-500-billion-bezos-zuckerberg/index.html [https://perma.cc/4XGB-4KPK].

178.   GDP per country ratings are available on the World Factbook, provided by the CIA at https://www.cia.gov/library/publications/the-world-factbook/fields/2195.html [https://perma.cc/LU4J-M3UA].

179.   GDP per capita country rankings are available on the World Factbook, provided by the CIA at https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html [https://perma.cc/NSR4-FFQH].

180.   According to Glassdoor, the lowest wage Amazon jobs pay about $13 per hour. $13 per hour * 62 = $806 per hour, which would convert, at a low $40 hours a week, to just under $1.7 million a year, ten times the famously high $100,000+ starting salaries for software engineers.

tech corporations deserve their wealth and those in retail only deserve to make the bare minimum.

Table 2: Net Worth per Employee of Major Corporations [181]

Corporation	Worth (Billion)	Full Time Employees	Worth Per Employee (Million)	Source (Retrieved from US Securities and Exchange Commission website)
Apple	$798	123,000	$6.5	Apple, Inc. (2017). *Form 10-K 2010.* https://www.sec.gov/Archives/edgar/data/320193/000032019317000070/a10-k20179302017.htm
Google (Alphabet)	$667	80,110	$8.3	Alphabet, Inc. (2017). *Form 10-K 2010.* https://www.sec.gov/Archives/edgar/data/1652044/000165204418000007/goog10-kq42017.htm
Microsoft	$571	124,400	$4.6	Microsoft, Inc. (2017). *Form 10-K 2010.* https://www.sec.gov/Archives/edgar/data/789019/000156459017014900/msft-10k_20170630.htm
Facebook	$500	*25,105	$19.9	Facebook, Inc. (2017). *Form 10-K 2010.* https://www.sec.gov/Archives/edgar/data/1326801/000132680118000009/fb-12312017x10k.htm
Amazon	$500	**566,000	$0.9	Amazon, Inc. (2017). *Form 10-K 2010* https://www.sec.gov/Archives/edgar/data/1018724/000101872418000005/amzn-20171231x10k.htm
Walmart	$262	2,300,000	$0.1	Walmart, Inc. (2017). *Form 10-K 2010* https://www.sec.gov/Archives/edgar/data/104169/000010416917000021/wmtform10-kx1312017.htm

* Likely full time due to low number, although they did not distinguish between full and part time
** Full and part time

181.   *Business Profile of Walmart Inc. ("WMT")*, CNN Bus. (Mar. 20, 2017), https://money.cnn.com/quote/profile/profile.html?symb=WMT [https://perma.cc/9A84-38FD]; Matt Egan, *Facebook and Amazon Hit $500 Billion Milestone*, CNN Bus. (July 27, 2017), https://money.cnn.com/2017/07/27/investing/facebook-amazon-500-billion-bezos-zuckerberg/index.html [https://perma.cc/E8AM-77Q9].

D. Tech as Infrastructure

It is easy to forget that tech itself is an infrastructure. In a private MIT conference on sport analytics in February 2018, former president Barack Obama noted that large social media networks are ubiquitous tools ("ISIS can use that tool. Neo-Nazis can use that tool.") and that large Internet platforms like Facebook and Google "have to have a conversation about their business model that recognizes they are a public good as well as a commercial enterprise."[182]

The Internet is an infrastructure used to communicate, learn, ideate, and share. Google is a tool to search, Facebook to connect, Amazon to shop. Tech creates infrastructure for people to travel, communicate, translate, watch news, clean homes, order food, secure buildings, and much more. Yet these increasingly essential tools are not all created to increase human output or satisfaction. Suppose citizens had to agree to give away the rights to their data in order to check out a book from a library. Imagine having to watch an advertisement in order to play in a park. What if a simple visit to the post office was designed to keep one there for as long as possible? From such a perspective, it becomes more obvious certain corporate technologies that claim to focus on building tools for humanity are more interested in silently earning large profits.

When Google created its holding company Alphabet in 2015 and dropped the once famous motto "don't be evil" in favor of "do the right thing," it probably seemed like a step in the right direction. "Don't be evil" is an incredibly low bar for any individual or government, but still seems almost altruistic as a corporate goal. The problem, however, with "do the right thing" is that it misses the "for whom." Who are the stakeholders when technology advances without restrictions? How as a society do people come to define the "right thing"? Is it fair to leave those answers up to corporations to decide when consumers generate the profit, preexisting infrastructure is the base of most platforms, and anyone can use or abuse the tools these corporations create?

Part of the problem is that society has yet to determine what constitutes an "evil" technology or what corporate actions are the "right thing." Tech corporations make money by creating resources that increasingly seem like standard human rights. Email, messaging, navigation, video uploads, and free tutorials might all seem like basic needs to someone born into a world of smartphones. Corporations deserve to profit for making these tools available, but they should also be held accountable to not overreach their boundaries by taking abusive shortcuts to make more money. The balance has gotten so out of hand that start-up founders who claim to be hopeful of creating a more fulfilling society often receive advice to start

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182. Robby Soave, *5 Things Barack Obama Said in His Weirdly Off-the-Record MIT Speech*, REASON (Feb. 26, 2018), http://reason.com/blog/2018/02/26/barack-obama-mit-sloan-sports [https://perma.cc/CGX6-L3PM].

by picturing creative ways to make themselves and investors huge payouts.[183] A growing pattern seems to be creating useful infrastructure for extortion rather than infrastructure to improve productivity. Just because the extortion is spread thinly amongst a billion users does not make it less nefarious.

Unfortunately, the U.S. government is currently structured to protect and encourage such behavior. Money is the driving force for power, and capital falsely implies a higher sense of deservedness. The American Dream, the goal and ideology that anyone with enough grit and determination can come from nothing to become something great, perpetuates a system that holds general societal progress back. It ignores the role of privilege while at the same time using it as an excuse for not doing anything about fixing it—*we cannot hire underrepresented minorities and women because there is a pipeline problem.* Those who have not made it yet can be satiated with the idea that they did not try hard enough or that when they do succeed, they too will be rewarded on a grand scale.

It might be for this reason that tech corporations hold on to their origin stories. One can still visit the Google garage that Larry Page and Sergey Brin moved into when they already had $1 million in funding. A prestigious university dropout turned investor that I talked to claims to have "been really poor," and said a lot of folks in Silicon Valley could identify with his situation where he "dropped out of college to start a company and then things went wrong . . . as they often do."[184] He was "living on ramen and coffee ice-cream and trying to figure out what [his team was] going to do to get more money and trying to figure out how [they were] going to pay rent next month."[185] The situation was "just frustrating."[186]

From a human rights perspective, none deserve to be so economically disenfranchised that they cannot imagine a stable future, whether they are university dropouts who can afford to be "poor" for a few years or those who have been working for decades and are afraid of losing their job to automation. People should not have to suffer to the point where when they "succeed" they think they deserve more than those financially beneath them. Innovation should be built and subsidized to encourage large scale societal progress. Excess revenue should go back into the engine that made it possible. The rhetoric of the American Dream is actively killing opportunities for people to build tools that improve society by narrowing who has access to learn how to innovate, limiting the types of projects that receive funding, creating monopolies that limit the competition from better solutions, and giving companies the freedom to extort users.

Conclusion: There is a pipeline issue for women and historically disenfranchised minorities at tech corporations, but the pipeline problem does

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183.   Recommended practices at investment firm, Y-Combinator's start up class at Stanford included tracking user behavior on the application and using that data to get them to use the platform as often as possible.

184.   Interview with anonymous startup investor (Spring 2017).

185.   *Id.*

186.   *Id.*

not explain the uncomfortable work environment many face within corporations, nor does it mitigate the responsibility of the company to patch holes leaking diverse talent. Despite being wildly successful, neither tech company wealth nor access to careers are passed proportionally to low-income locals. Instead, many tech corporations form gentrification bubbles that prevent tech money from spreading to local resources. Corporations have been willing to invest money and forgo security standards to enter foreign markets like China, while fighting lawsuits to maintain dominance in the European Union. Given that top firms have net worth equivalent to the GDPs of size-able nations, the freedom of poor countries to stand up to tech giants should be a concern. In the end, tech is infrastructure and is increasingly setting a higher base standard of living. If modern technology is the foundation of the future, society has a responsibility to prevent abusive revenue structures and ensure equal access to building, using, and improving these platforms.

PART IV – IN SEARCH FOR A CURE

I am now convinced that the simplest approach will prove to be the most effective—the solution to poverty is to abolish it directly by a now widely discussed measure: the guaranteed income.[187]

One summer while I was interning in Silicon Valley, a singular opportunity was presented to do "social good." The impact of the event was, however, questionable. In this case, we, interns, were relieved of a day of traditional work—forty-two dollars per hour for software engineering interns—to do "social good." We were ushered into a room and handed black t-shirts with the company name followed by "<3 SF" and told that photographing and tweeting about the experience was encouraged. A company representative informed us that employees can be paid to volunteer for a certain amount of days per month. Then a Meals on Wheels official dispersed pages with addresses to visit—the group would deliver food to the primarily elderly local poor.

List in hand, as I meandered with a fellow intern to find the individuals on our list. We entered the low-income housing units in our new company t-shirts, saying we were interns with Meals on Wheels. We knocked on doors with smiles. One door we knocked on for a while with no answer. Finally, the door creaked open to reveal a veteran on the ground, naked, stretching his fingers toward the handle. We did not know what to do or how to give him his box. He started chatting, so we stayed with him—us in the narrow hallway and him in his apartment corridor. We squatted to relieve the awkwardness of towering over an old naked man.[188]

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187.   MARTIN LUTHER KING, JR., WHERE DO WE GO FROM HERE 171 (1967).

188.   Financing employee volunteer hours and supporting local causes is a great step above nothing. However, it is doubtful that the interns' singular afternoon of social good over a ten-week period—which included a free bowling night, complementary backpacks from the Swiss Army Knife company, stand up paddle boarding, Friday breakfasts, and multiple office parties that we were effectively paid to attend—was that impressive. It might have been better for the interns to stay at work

A. The Welfare Queen

Poverty in the United States seems objectively paradoxical. The United States is home to over one quarter of the world's billionaires.[189] Yet, even in 2011 approximately 1.65 million adults and 3.55 million children lived on two dollars per day or less.[190] There exists a conservative fear that hard-earned taxpayer dollars fund lounging welfare queens.[191] This perception is not new, but it has been more finely honed over time.[192] According to Professor Kaaryn Gustafson, "[i]n the 1970s, the image of low-income mothers took a particularly negative turn."[193] That is, "California Governor (later President) Ronald Reagan used the symbol of . . . the welfare queen to portray an image of widespread depravity and criminality among low-income women of color."[194] She writes that "[d]espite the factual inaccuracies of Reagan's descriptions, the symbol of the welfare queen resonated with the public."[195]

Perhaps this disparaging, mythological welfare queen image resonated because the ground had been set decades before with the infamous *Moynihan Report*.[196] Indeed, the report was "framed as an attempt to diagnose the social, economic, and cultural conditions that produce a disproportionately large number of black, single, female heads-of-household with children, as compared to other

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and donate their day's income ($336 excluding tax per engineering intern) to Meals on Wheels and pay people who could use a source of income to deliver them. It seems like the tech company's employees benefited most from the philanthropic system, not those negatively impacted by rising housing costs and gentrification. The impact, while perhaps positive, likely barely made a dent in comparison to the impact of hiring fifty summer interns in San Francisco.

189.   Fang Block, *Number of Billionaires Around the World Rises 13% in 2017*, MANSION GLOBAL (Mar. 21, 2017), https://www.mansionglobal.com/articles/number-of-billionaires-around-the-world-rises-13-in-2017-57517 [https://perma.cc/Q9PB-L9PC].

190.   *See, e.g.*, H. Luke Shaefer & Kathryn Edin, *The Rise of Extreme Poverty in the United States*, *in* INEQUALITY IN THE 21ST CENTURY 128 (David B. Grusky & Jasmine Hill eds. 2017).

191.   *See, e.g.*, Albiston & Nielsen, *supra* note 151, at 515 ("Focusing on the reproductive abilities of mothers, but not fathers, of poor children implicitly accepts the 'welfare queen' stereotype-that is, a welfare recipient is a black woman who has children in order to live a life of leisure on the taxpayer's money."); Kaaryn Gustafson, *The Criminalization of Poverty*, 99 J. CRIM. L. & CRIMINOLOGY 643, 653 (2009); Camille Gear Rich, *Reclaiming the Welfare Queen*, 25 S. CAL. INTERDISC. L.J. 257, 258 (2016) ("[A] Senate report commissioned by Daniel Patrick Moynihan in 1965 to investigate what he claimed was a social and cultural crisis compromising the family formation process in the African American community.").

192.   Gustafson, *supra* note 191, at 653 ("[W]elfare cheating had always been an issue in poverty politics.").

193.   *Id.*

194.   *Id.*

195.   *Id.*

196.   *See, e.g.*, DANIEL P. MOYNIHAN, U.S. DEP'T OF LABOR, OFFICE OF THE ASSISTANT SEC'Y FOR ADMIN. AND MGMT., THE NEGRO FAMILY: THE CASE FOR NATIONAL ACTION (1965); Ann Cammett, *Deadbeat Dads and Welfare Queens: How Metaphor Shapes Poverty Law*, 34 B.C. J.L. & SOC. JUST. 233, 255–56 (2014); Frank F. Furstenberg, *If Moynihan Had Only Known: Race, Class, and Family Change in the Late Twentieth Century*, 621 ANNALS AM. ACAD. POL. & SOC. SCI. 94 (2009); *see also* Michele Estrin, *Gilman, Welfare, Privacy, and Feminism*, 39 U. BALT. L.F. 1, 4 (2008) ("A backlash against welfare mothers reached a frenzy in the 1980s, as the media and policymakers portrayed welfare mothers as lazy and promiscuous. President Reagan famously attacked them as 'welfare queens.'").

racial groups."[197] However, as Professor Camille Gear Rich explains, "Because many black families deviated from the cultural norm of the male head-of-household or breadwinner, Moynihan argued that these families were destined to be long-term dependents on state assistance programs."[198] In the years since, prominent scholars have debunked those claims,[199] pointing out that "evidence has made it clear that economic conditions, rather than culture, powered the rise of single, female heads-of-household in the United States."[200]

Meanwhile, the welfare system does not meet the needs of many in poverty, and those who try to earn additional revenue face punishing consequences, such as losing access to benefits.[201] Moreover, invasions of privacy are an important concern and trade-off when receiving welfare funds.[202] According to Professor Camille Gear Rich,

> [T]he state often uses these social welfare programs as an opportunity to promote a normative understanding of family life and punish those who violate these strictures. Politicians propose symbolic welfare restrictions to remind TANF recipients of their abject, regulated status, even when there is no evidence of wrongful behavior. They also know that these "symbolic" restrictions serve as a panacea or safety valve for the frustration of the working poor who do not receive welfare benefits. Poor workers often cannot afford material luxuries, and they enjoy some solace when they have public confirmation that welfare recipients are also required to endure the same kind of deprivation.[203]

The current manner in which poverty is addressed does not align well with the automation evolution, nor does it reconcile with American principles of individual "liberty and justice for all." For one of the world's most prosperous countries, the U.S. has alarming rates of poverty. A 2012 report comparing industrial countries in

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197. Rich, *supra* note 191, at 258.

198. *Id.*

199. *See, e.g.*, ANGE-MARIE HANCOCK, THE POLITIC OF DISGUST: THE PUBLIC IDENTITY OF THE WELFARE QUEEN 56 (2004); Cammett, *supra* note 196, at 255–57; Gustafson, *supra* note 191, at 650; Rich, *supra* note 191, at 258.

200. Rich, *supra* note 191, at 258.

201. Gustafson, *supra* note 191, at 661, 693 (2009); Rich, *supra* note 191, at 265–66 ("The only difference today is these mothers are more quickly thrust into the pool of the working poor; they receive extremely short-term welfare benefits; and, further, they are subject to an array of humiliating symbolic restrictions during the period they receive cash support. Indeed, in the same month that the Reframing the Welfare Queen symposium was held, government officials in several states issued restrictions on welfare benefits that prevented poor mothers from purchasing cruises, theme park tickets, tattoos, nail salon services, and other non-essentials. These restrictions seem particularly ironic given that the standard welfare allotment is barely sufficient to support a family's basic food and housing requirements in most jurisdictions. The restrictions are even more ironic given that there is no evidence that substantial state or federal dollars were going to non-essential items.").

202. *See, e.g.*, Michele Estrin Gilman, *supra* note 196, at 27 (pointing out how welfare regulations interfere with poor women's privacy rights).

203. Rich, *supra* note 191, at 266.

the Organization for Economic Co-operation and Development[204] found that the United States has the highest relative poverty and fourth lowest expenditure on social welfare programs as a percentage of GDP.[205] In other words, in terms of poverty, the United States is doing much worse than peer nations while spending relatively little money to fix it. Simultaneously, it is expensive to be poor. Bank overdraft fees and high loan interest rates are more likely to be applied on to those with the least resources.[206]

The United States also has long perpetrated inequality while practicing minimal redistributive justice. Native American tribes were rooted to American soil long before Europeans arrived and practiced mass genocide. Today, many of the proportionally few Native Americans left live on reservations that occupy only a fraction of their previous land.[207] The trauma of the Native American people has had long lasting effects. In 2014, 28.3% of single race Native Americans were living in poverty, higher than any other single race group.[208] Similarly, blacks in the United States have long suffered injustices dating back from being shipped from Africa in the 1600s, to segregation in the 1900s and the prison industrial complex in the 2000s.[209] Today, convicted white men have a higher chance of being hired than black men without a criminal record.[210] Poverty is a persistent problem, imposed for generations through legal policies by a ruling class protecting its own interests.

The separation between the deserving and the undeserving is a reality of the U.S. welfare system that leads to the poverty trap, low uptake of social services, and limits the freedom of those most in need. Signing up for benefits is a confusing,

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204. The countries included, in order of child poverty rates, were Iceland, Finland, Cyprus, Netherlands, Norway, Slovenia, Denmark, Austria, Sweden, Switzerland, Ireland, Germany, France, Malta, Belgium, Australia, Slovakia, New Zealand, United Kingdom, Luxembourg, Canada, Japan, Italy, Greece, Spain, and the United States. Elise Gould & Hilary Wething, *U.S. Poverty Rates Higher, Safety Net Weaker than in Peer Countries*, ECON. POL'Y INST. 3–6 (2012).

205. *Id.*

206. A prevailing rhetoric persists that the poor needs to pull themselves up by their bootstraps, yet due to financial infrastructures that assist the wealthy and exploit the poor, it may be more expensive to be poor than rich. *See* IT'S EXPENSIVE TO BE POOR, ECONOMIST (Sep. 3, 2015), https://www.economist.com/news/united-states/21663262-why-low-income-americans-often-have-pay-more-its-expensive-be-poor [https://perma.cc/8GG3-6RC9].

207. Steven Platzman, *Objects of Controversy: The Native American Right to Repatriation*, 41 AM. U. L. REV. 517, 517–19 (1992) ("The settlers wished to cultivate the land and fulfill the manifest destiny of the American nation. The Native Americans, on the other hand, wanted to retain the land and develop their cultural heritage. Inevitably, the increased tension led to armed conflicts. Throughout the nineteenth century, the European colonists systematically eliminated Native American resistance, uprooted whole nations, and virtually destroyed the indigenous culture.").

208. U.S. CENSUS BUREAU, AMERICAN INDIAN AND ALASKA NATIVE HERITAGE MONTH: NOVEMBER 2015 (2015), https://www.census.gov/newsroom/facts-for-features/2015/cb15-ff22.html [https://perma.cc/2UX8-YAFT].

209. *The New Jim Crow* by Michelle Alexander provides a starting point for those interested in the continued history of black disempowerment in the United States. MICHELLE ALEXANDER, THE NEW JIM CROW: MASS INCARCERATION IN THE AGE OF COLOR BLINDNESS (2010).

210. Devah Pager, *Marked: Race, Crime, and Finding Work in an Era of Mass Incarceration*, *in* INEQUALITY IN THE 21ST CENTURY 308, 312 (David B. Grusky & Jasmine Hill eds., 2017).

exhaustive, and stigmatized process that would be annoying at best to endure. In the 1990s, Aid to Families with Dependent Children (AFDC) was replaced by state allocated Temporary Assistance for Needy Families (TANF) that limits cash assistance to five years.[211]

Such limitations mean that if a resident moved, she would need to familiarize herself with the benefit system in her new state, reapply to programs, and hope she remains eligible. Earned Income Tax Credit (EITC), one of the favored forms of welfare that has bipartisan support, is inherently biased because it requires income in order to receive tax returns.[212] The formerly incarcerated, especially those of color, have a difficult time finding employment and therefore are predominantly ineligible. Other forms of welfare support have steep cutoffs and are only granted if a participant meets certain requirements.[213] If the welfare grant is not enough money and the participant works to meet her needs, she may be denied benefits entirely. This catch-22 leaves many fully dependent on the government because they cannot afford to lose their benefits by working.

Meanwhile, those who are well-off, for the most part, have free jurisdiction on how they spend their income and receive tax write-offs for being generous citizens. Charity write-offs increase with wealth, so someone in the highest 39.6% tax bracket only pays sixty-five dollars for a one hundred dollar donation, as opposed to someone in the 15% tax bracket who pays eighty-five dollars.[214] Since it has been established that some have been historically uplifted while others have been systematically oppressed, it seems somewhat unfair that the wealthy are rewarded for choosing where their donations go by sending less revenue to the government. When one considers that churches and heavily endowed private universities, such as Stanford University—which, along with its Board of Trustees, was found to "hold four offshore investments in Bermuda and the Cayman

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211. GENE FALK, THE TEMPORARY ASSISTANCE FOR NEEDY FAMILIES (TANF) BLOCK GRANT: A LEGISLATIVE HISTORY 6–67 (Congressional Research Service, 2017).

212. *EITC, Earned Income Tax Credit, Questions and Answers*, INTERNAL REVENUE SERV., http://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-earned-income-tax-credit-questions-and-answers#Who_can_claim [https://perma.cc/H7WZ-EF9K] (last visited June 18, 2019) ("You must have earned income from working for someone else or owning or running a farm or business").

213. One such example is SNAP, formerly the food stamp program, where one must not only stay below the annual poverty threshold and also meet other requirements. *See A Quick Guide to SNAP Eligibility and Benefits*, CTR. ON BUDGET & POL'Y PRIORITIES, https://www.cbpp.org/sites/default/files/atoms/files/11-18-08fa.pdf [https://perma.cc/43WL-J5JA] (last updated Oct. 16, 2019) ("Some categories of people are not eligible for SNAP regardless of their income or assets, such as individuals who are on strike, all unauthorized immigrants, and certain lawfully present immigrants. Unemployed childless adults who do not have disabilities are limited to three months of SNAP benefits every three years in many areas of the country, and states have broad authority to extend work requirements to many other SNAP households.").

214. These amounts were calculated using Charity Navigator's online Giving Calculator. *See Giving Calculator*, CHARITY NAVIGATOR (Jan. 31, 2018), https://www.charitynavigator.org/index.cfm?bay=content.view&cpid=40 [https://perma.cc/LWW5-7T4B].

Islands"[215] —count as charity, it seems obvious how organizations that satisfy the wealthy could receive more than those that assist the poor.

Existing programs for addressing poverty, inequity, paternalism, philanthropy, and technology tend to approach the problems separately and not at the national level. Some solutions help certain aspects while negatively contributing to others. Existing welfare programs tend to contribute to paternalism and the poverty trap, while programs aimed at the growing trend of automation tend to assist individuals in learning technical skills instead of addressing inequality as a whole. Affirmative action and scholarship programs might reduce inequality in certain fields but disproportionally help the high achieving. While there are critics of the current philanthropy system, nothing seismic has been done to change the power of discretion available to the wealthy.

It is difficult to measure the strength of the U.S. social safety net, because if an intervention works, it will not be captured by census data. Nonetheless, some of the most successful programs are divided under different departments, including Earned Income Tax Credit with approximately 30 million recipients and a budget of $70 billion per year; Child Tax Credit (CTC) with thirteen million recipients and a budget of $57 billion per year; Food Stamps with approximately forty-seven million recipients and a budget with $74 billion per year; Social Security with approximately fifty-nine million recipients and a budget of $859 billion per year; Medicare with fifty-four million recipients and a budget of $617 billion per year; and Supplemental Security Income with approximately eight million recipients and a budget of $60 billion per year.[216] Each program addresses a slightly different symptom of poverty, but many individuals who could use the benefits are often excluded, do not take advantage of existing opportunities, or simply cannot receive enough to satisfy their needs. The overall effect of these programs is a net positive, but alone they are not enough.

B. The State of Tech Philanthropy

Companies can often direct concerns about their social impact to their philanthropy work. Google has an in-house philanthropy. Facebook hosts farmers markets at the intersection of East Palo Alto and Menlo Park.[217] Amazon is

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215. Joe Kukura, *Tech's Tax Paradise*, S.F. WKLY. (Nov. 21, 2017, 8:28 AM), http://www.sfweekly.com/news/news-news/techs-tax-paradise [https://perma.cc/BM3J-T627].

216. David Grusky, *Ending Poverty with Technology* (2017) (PowerPoint presentation) (on file with author).

217. During my time volunteering in East Palo Alto, I was invited to visit the market by a retirement-age friend of mine, but unfortunately I could not make it. She loves the event while one of her friends said he thought Facebook was trying to buy the community off. *See* Linda Hubbard Gulker, *Facebook Launches Mobile Farmers Market in Menlo Park & East Palo Alto*, INMENLO (July 23, 2017), https://inmenlo.com/2017/07/23/facebook-launches-mobile-farmers-market-in-menlo-park-east-palo-alto/ [https://perma.cc/FX5D-RLB5].

incorporating a homeless shelter in a new Seattle office building[218] and allows customers to always donate a little with their purchases by shopping on Amazon Smile.[219] Microsoft maintains a philanthropy page where they offer grants and share progress on projects to empower people and communities.[220] Tinder donated $250,000 to global organizations that support women's causes.[221] Lyft can round up your balance and donate it to charity.[222] These stories are common—companies that may offer their six-figure engineering employees free breakfast, lunch, dinner, and kombucha on tap are generous enough to give a small percentage of their funds to causes they are willing to support.

Corporate tech philanthropy is, however, not ubiquitous across Silicon Valley. As a philanthropy director noted, the "continued belief among people in business is that it is not potentially valuable to give back unless there is . . . a win-win."[223] While matching programs may gain short term traction after a disaster or when an issue gains media attention—likely due to the "win-win" nature of being able to publicize donations, make employees happy, and please customers—long standing problems that tech may contribute to are often shrugged off. "In crisis situations this is very, very common where it's like you know 'ahh an earthquake' or 'ebola' and x, y, and z companies respond, . . . there is an expectation that you'll respond as well."[224] The director I talked to shared, "I wish that there was less short-term-ism about it and perhaps a little bit more thoughtful and plan-ful [action], but I think that's just life."[225]

Giving seems to be a bonus and not a responsibility for the majority of tech corporations. When giving is done, it is often presented as a heroic effort instead of what those impacted negatively by technology could see as the least one could do. Institutions like the Founders Pledge—a binding legal commitment for those who hold equity in a company to donate at least two percent of exit earnings—while making a positive impact, assist in such a narrative. As of February 2019 the site's FAQ page informs that the average giving amount hovers around seven percent

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218.   Nick Wingfield, *Amazon to Share New Building with Homeless Shelter in Seattle*, N.Y. TIMES (May 10, 2017), http://www.nytimes.com/2017/05/10/technology/amazon-homeless-shelter-seattle.html [https://perma.cc/ZEN8-L5TN].

219.   "The AmazonSmile Foundation will donate 0.5% of the purchase price from your eligible AmazonSmile purchases" at no cost to shoppers. Interestingly, AmazonSmile is not the default website of Amazon and is not currently heavily advertised on amazon.com. To learn more visit: *About Amazon Smile*, AMAZON, https://smile.amazon.com/gp/chpf/about [https://perma.cc/EYE4-986J].

220.   Visit: *Philanthropies*, MICROSOFT, https://www.microsoft.com/en-us/philanthropies [https://perma.cc/QH7S-4DPV].

221.   Nhu Te, *Tinder Is Pro-Women (And It's a Beautiful Thing)*, NONPROFIT PRO (Mar. 9, 2017), http://www.nonprofitpro.com/article/tinder-is-pro-women-and-its-a-beautiful-thing [https://perma.cc/J7E3-GUTA].

222.   Visit: *Round Up & Donate*, LYFT, https://www.lyft.com/round-up [https://perma.cc/AHU7-WVWG].

223.   Telephone Interview with anonymous philanthropy director (Fall 2017).

224.   *Id.*

225.   *Id.*

and that they can help "optimize the [donation] amount for the best tax break."[226] Givers are welcome to choose any charity that they wish as long as it is not political or involved in missionary work. If the business fails or it never exits, "[it's] off the hook."[227]

Some CEOs choose to give independently rather than through their corporations. Former Microsoft CEO Bill Gates and his spouse Melinda Gates are famously generous. Their foundation website, as of February 2019, boldly states in all-caps, "All Lives Have Equal Value" followed by "we are impatient optimists working to reduce inequality."[228] The two, along with Warren Buffet, created The Giving Pledge in 2010, a non-legally-binding agreement for billionaires to give fifty percent or more of their wealth over the course of their lifetimes or in their will.[229] Mark Zuckerburg and his wife, Dr. Priscilla Chan, signed the pledge in 2015[230] and have been doing their share of work with the Chan Zuckerberg Initiative. Chan and Zuckerberg claim that "the only way that we reach our full human potential is if we're able to unlock the gift of every person around the world."[231] At $90 billion and $71 billion, Bill Gates and Mark Zuckerberg are the second and fifth wealthiest people in the world respectively—if they were to give away half their wealth today, Zuckerberg would remain in the top thirty and Bill Gates would still be in the top twenty of the world's wealthiest people.[232]

Doing good is often easier said than done. In November 2017, families living in Recreational Vehicles (RVs) and camper vans adjacent to the building site of the Chan Zuckerberg funded Primary School, a tuition free dual health education modeled private school to serve primarily low-income students, were handed twenty-four-hour eviction notices from East Palo Alto City.[233] Local activists locked arm in arm to protest the evictions. They helped move vans to prevent campers from being towed. The city stated that the camp posed a health hazard due to people disposing human waste into sewers, but did not tell residents where they could go.[234] According to Ravenswood City School District Superintendent Gloria Hernandez-

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226.   The Founders Pledge FAQ page can be visited at *FAQs*, FOUNDERS PLEDGE, http://founderspledge.com/en-US/faq [https://perma.cc/7PRS-RHQE].

227.   *Id.*

228.   The Bill & Melinda Gates Foundation site can be visited at BILL & MELINDA GATES FOUNDATION, https://www.gatesfoundation.org [https://perma.cc/ADW8-DFG8].

229.   Charlie Rose, *60 Minutes: The Giving Pledge*, CBS NEWS (Mar. 27 2016), http://www.cbsnews.com/news/60-minutes-giving-pledge [https://perma.cc/PM5N-9BCA].

230.   *PBS NewsHour: How Zuckerburg and Chan Just Changed Big Charitable Giving* (Dec. 3, 2015), http://www.pbs.org/newshour/show/how-zuckerberg-and-chan-just-changed-big-charitable-giving#transcript [https://perma.cc/6XDB-YT2P].

231.   *Id.*

232.   *Billionaires: The Richest People in the World*, FORBES (March 5, 2019), http://www.forbes.com/billionaires/list/#version:static [https://perma.cc/QH2L-2UZZ].

233.   Sue Dremann, *RV Evictions in East Palo Alto Protested Almanac Online*, ALMANAC (Nov. 15, 2017), http://www.almanacnews.com/news/2017/11/15/rv-evictions-in-east-palo-alto-protested [https://perma.cc/W54B-F5Z9].

234.   *Id.*

Goff, over half of school district students are in unstable housing or homeless.[235]
An influx of tech workers made housing unaffordable, so people moved into RVs
and on to the streets. Because no one created the appropriate infrastructure to
support the low income, those who were forced out became the problem.

The same models for individual donations exist at the corporate level—Pledge
1% allows corporations to pledge to donate one percent of time, equity, product,
or profit to any cause of their choosing.[236] Google, not a member of Pledge 1%,[237]
has its own philanthropy, Google.org, that announced in 2017 that it would be
doubling efforts, investing $1 billion in grants and $1 million in employee
volunteering over the next five years.[238] While their efforts are admirable, focusing
on "closing the world's education gap," "helping people prepare for the future of
work," and "using data science and innovative new approaches to advance inclusion
and justice for all,"[239] it is not clear if their efforts are comparable to the wealth
generated from their business practices—the five year effort adds up to 0.9% of
Google's 2017 *yearly* revenue.[240]

Then, of course, there are the tech corporations that do not offer any
community grants. Former Apple CEO Steve Jobs was notoriously ambivalent
about philanthropy, eliminating all corporate giving in 1997.[241] Fortunately, when
Tim Cook took over in 2012, he introduced employee matching up to $10,000 and
volunteer matching programs, donating twenty-five dollars for each hour an
employee volunteers.[242] Despite being quite the philanthropist, Zuckerberg believes
Facebook itself is a social good, so philanthropy does not need to be woven in to

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235. *Id.*

236. For an overview of Pledge 1%, visit *How It Works*, PLEDGE 1%, http://
pledge1percent.org/overview.html [https://perma.cc/JK8B-53KU].

237. Neither Google nor Alphabet is listed publicly on the participant page *We've Pledged 1%*,
PLEDGE 1%, http://pledge1percent.org/pledged.html [https://perma.cc/TCQ6-T6BU].

238. Sundar Pichai, *Grow with Google: Opportunity for Everyone*, GOOGLE (Oct. 12, 2017), http://
/blog.google/topics/causes-community/opportunity-for-everyone [https://perma.cc/92LT-GW9Y].

239. *Our $1 Billion Commitment to Create More Opportunity for Everyone*, GOOGLE, http://
www.google.org/billion-commitment-to-create-more-opportunity [https://perma.cc/L3BA-832J]
(last visited June 18, 2019).

240. *See Alphabet Announces Fourth Quarter and Fiscal Year 2017 Results*, ALPHABET (Feb. 1,
2018), http://abc.xyz/investor/pdf/2017Q4_alphabet_earnings_release.pdf [https://perma.cc/
8ZRT-9VVR].

241. Andrew Ross Sorkin, *The Mystery of Steve Jobs's Public Giving*, N.Y. TIMES (Aug. 29, 2011),
http://dealbook.nytimes.com/2011/08/29/the-mystery-of-steve-jobss-public-giving/?mtrref=
www.google.com [https://perma.cc/MK4Z-QNDT]; *see also Growth & Enjoyment: Apple Matching
Gifts Program*, APPLE (2014), https://doublethedonation.com/forms/apple-guide.pdf [https://
perma.cc/D5AT-6223].

242. Mike Scutari, *Making up for Lost Time: As Apple Ramps up Its Philanthropy,
Will Its Executives Follow Suit?*, INSIDE PHILANTHROPY (Sept. 18, 2017), http://
www.insidephilanthropy.com/home/2017/9/18/apple-executives-philanthropy-philip-schiller
[https://perma.cc/7H5U-V2HP].

the fabric of the institution.[243] If the state of giving in Silicon Valley were to be summarized, it would be the following: corporations do what they want with their money in the way that they find to be the most reasonable and effective.

Thus, there is an odd duality in the tech philanthropy sphere. It suggests that tech corporations should have full discretion over their donations, but it is the government's job to ensure equal opportunities. Accordingly, corporations should not be taxed more, and it is not their responsibility to assist the communities they gentrify. It follows that, it would be "nice" to do something good, but corporate responsibility primarily lies in increasing shareholder value. At their core, companies cannot fulfill their civic duties alone. There is no uniform metric to measure level of international impact or clear solution of how to mitigate it. Tech corporations that open internal philanthropies just create opportunities to fund projects they find interesting, which may or may not lead to universal increases in standards of living and lower wealth inequality.[244] Not all solutions to global issues are tech-based or self-sustainable. While philanthropy is less wasteful than stock piling funds, it is also not the most effective means to fulfill corporate responsibility.

Corporate philanthropy is a positive tool to boost employee morale, use innovation for good, increase consumer interest, and provide opportunities for sectors and groups the industry is interested in enriching. Unfortunately, it does not and cannot fix the problems that corporate tech creates. There is a misalignment of interests between pushing automation and ensuring that people keep their jobs, benefitting from the privatization of innovation and releasing tools to the public, and increasing revenue through legal tax evasion and spreading wealth globally. Doing good in one sector does not mitigate negative impact in another. Moreover, any solution scaled to decrease negative outcomes would demand much more than one percent of corporate resources due to the fact that wealth inequality contributes to poverty.

Currently, tech revenue is significantly boosted by systems not everyone has access to use. Giving corporations additional freedom to allocate funds that are not entirely theirs is antithetical to goals of equality. Theoretically, consumers could stop supporting corporations that do not adhere to their values, but if that were easily possible many large tech corporations would probably already be out of business or have changed their revenue models. It is common knowledge that Facebook makes users depressed, that Uber, Lyft, and Amazon weaken preexisting markets, and that Google tracks websites visited and then sells that data to show personalized

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243.   Robert Safian, *Mark Zuckerberg on Fake News, Free Speech, and What Drives Facebook*, FAST CO. (Apr. 11, 2017), http://www.fastcompany.com/40397297/mark-zuckerberg-on-fake-news-free-speech-and-what-drives-facebook [https://perma.cc/C8A4-WX35].

244.   Similar arguments can be made for "Mega-Foundations" where wealthy actors have the ultimate freedom to donate in whatever way suits them best and receive tax deductions. Robert Reich's freedom-based argument "What are Foundations For?" provided inspiration from a different context for this section. Robert Reich, *What Are Foundations for?*, BOS. REV. (Mar. 1, 2013), http://bostonreview.net/forum/foundations-philanthropy-democracy [https://perma.cc/WAT8-ABGD].

advertisements. An April 2017 study even showed that the mere presence of a smart phone limits cognitive ability.[245] People keep using technology because it becomes the new standard of living—they do not have a choice when everyone else is already on the platforms. Staying is better than leaving even if the revenue streams and designs are manipulative and abusive.

The essential nature of technology enhances its responsibility to consumers and humanity at large. Consumers expect their expensive iPhone to keep working and not shut down. Students trust Facebook's security settings when they publish statuses and post photos. One trusts Google with one's email, storage, documents, and unbiased search results. These companies were given the advantages to create the infrastructure that many in the world rely on every day and trust with a power dynamic arguably stronger and more lifelong than parents to children. Tech corporations rely on their users as their users rely on them. They cannot extricate themselves from responsibility by dedicating a sliver of revenue to philanthropy, just as their users cannot simply stop using monopolized platforms.

C. Universal Basic Income

Perhaps the most *efficient* way of alleviating poverty is by addressing the problem at its core—by giving citizens money through redistribution without limiting access by means testing. One concept to achieve this is the universal basic income (UBI) guarantee. UBI has five main tenets. First, it must be periodic, occurring in regular intervals as opposed to a one-off payment. Second, the grant must be in cash as opposed to in-kind, like food stamps or housing vouchers. Third, the basic income must be distributed on an individual basis as opposed to household grants like EITC. Fourth, the grant must be given universally without means testing. And, finally, it must be unconditional without paternalistic measures determining continued eligibility. Adding the term "guarantee" after UBI usually implies that the system is promised to remain in place for an extended period of time.

Basic income is not a new idea.[246] The concept that the government has a moral responsibility to provide a minimum income dates back to Juan Luis Vives (1492–1540). Vives believed that no one should die of hunger, but that those without resources should be forced to work: "the infirm and aged, too, should have lighter tasks assigned to them suited to their age and strength. No one is so feeble

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245.   Adrian Ward et al., *Brain Drain: The Mere Presence of One's Own Smartphone Reduces Available Cognitive Capacity*, 2 J. ASS'N FOR CONSUMER RES. 140, 140 (2017), https://www.journals. uchicago.edu/doi/abs/10.1086/691462 [https://perma.cc/993Y-QQ74].

246.   For a more thorough exploration through the history of basic income and to view where the following information is based, one can visit: *History of Basic Income*, BASIC INCOME EARTH NETWORK, http://basicincome.org/basic-income/history [https://perma.cc/X7JH-GBWF]. The Basic Income Earth Network (BIEN)'s mission is to "offer education to the wider public about alternative arguments about, proposals for, and problems concerning, basic income as idea, institution, and public policy practice." *About BIEN*, BASIC INCOME EARTH NETWORK, https:// basicincome.org/about-bien [https://perma.cc/AZ43-QAPU].

and lacking in strength that they can do nothing."[247] This concept was later joined with those of Thomas Paine (1737–1809).[248] Paine believed that the world in its natural state would have been shared by the human race and therefore property owners owe the community "ground-rent."[249] Ground-rent funds would be used to pay lump sums to every member of society when they turned twenty-one years of age.[250]

Basic income gained traction in the United States in the 1960s under different dogmas. Robert Theobald argued that automation was rendering work obsolete, Milton Friedman believed that a "negative income tax" could integrate the tax and welfare systems, and James Tobin, John Kenneth Galbraith, and others published a paper advocating for an automatic cash payment for all citizens.[251] Meanwhile, in 1966, in the second bullet of its Ten Point Program, the Black Panther Party stated, "[T]he federal government is responsible and obligated to give every man employment or a guaranteed income."[252] And, in 1967, the year before Dr. Martin Luther King's untimely death, he released the book, *Where do We Go From Here*, which advocates for a "guaranteed income."[253] The interest generated in North America during this time led to five guaranteed income experiments, one in Canada and four in the United States.[254]

Fear of autonomous job takeover is only one of many reasons why some advocate for UBI. Finland is running a UBI experiment to test if it might encourage work, as some Finns fear starting work and risking losing benefits while still in need.[255] Ontario, Canada is running a basic income pilot to see if UBI "can better support vulnerable workers, improve health and education outcomes for people on low incomes, and help ensure that everyone shares in Ontario's economic growth."[256] Meanwhile, the Alaska Permanent Fund Dividend (PFD), a fairly unconditional yearly payout awarded to all Alaskans, operates under the premise

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247.   JUAN LUIS VIVES, ON ASSISTANCE TO THE POOR 41 (Alice Tobriner trans., 1999).

248.   *History of Basic Income*, BASIC INCOME EARTH NETWORK, http://basicincome.org/basic-income/history [https://perma.cc/BV9U-G8AA].

249.   *Id.*

250.   *Id.*

251.   *History of Basic Income, supra* note 248

252.   Andrew Beale et al., *The Black Panther Party's Ten-Point Program, 50 Years Later*, OAKLAND   NORTH (Nov. 4, 2016), http://oaklandnorth.net/2016/11/04/the-black-panther-partys-ten-point-program-50-years-later [https://perma.cc/T72F-588M].

253.   KING, JR., *supra* 187, at 171 ("I am now convinced that the simplest approach will prove to be the most effective—the solution to poverty is to abolish it directly by a now widely discussed measure: the guaranteed income.").

254.   *History of Basic Income, supra* note 248.

255.   Peter S. Goodman, *Free Cash in Finland. Must Be Jobless.*, N.Y. TIMES (Dec. 17, 2016), http://www.nytimes.com/2016/12/17/business/economy/universal-basic-income-finland.html [https://perma.cc/9X5A-XXKF].

256.   ONTARIO, ONTARIO'S BASIC INCOME PILOT: STUDYING THE IMPACT OF A BASIC INCOME 2, https://files.ontario.ca/170508_bi_brochure_eng_pg_by_pg_proof.pdf   [https://perma.cc/VG3T-D4YW].

that all Alaskan residents deserve returns on mineral royalties from State land usage.[257]

The swings of public enthusiasm for UBI must be amusing or frustrating for longtime advocates like Belgian philosopher, Philippe Van Parijs, who has published extensively on the philosophy and pragmatics of UB—these publications include his newest book, *Basic Income: A Radical Proposal for a Free Society and a Sane Economy*, and his perhaps most famous work*, Real Freedom for All: What (if anything) can justify capitalism?* His work anchors a growing body of modern philosophic UBI literature including arguments on gender justice, racial equality, automation, and freedom. Meanwhile, experimental research has shown that cash grants may positively impact health and education,[258] increase entrepreneurship and women's equality, and do not significantly reduce commitment to work.[259]

Unfortunately, no attempted study has yet replicated all five tenets of UBI on scale in an industrialized country, so it is impossible to know the precise accuracy of intellectual hypothesis and experimental findings for a nation like the United States. Given that policies are more likely to be implemented the higher the estimated likelihood of success and that running a sufficient UBI experiment likely would require government policy, progress toward a national UBI without radical intervention seems destined to be slow at best. Especially, given that common UBI concerns persist, ranging from funding—*Would it cause inflation? If it is funded through income tax will the wealthy leave? Would it take away from other welfare programs?*—to eligibility—*Can immigrants receive it? Is it a waste of money to give to the rich? Would the sick receive more?* Despite the benefits of basic income, the lingering design questions and money needed to fund such a large-scale program leave policy makers trapped.

D. Better Solution

In general, tech corporations do not want to be held responsible for eliminating the problems they contribute to or from which they benefit. Unfortunately, sometimes the tools they create are so incredible that they become essential and, without market regulation, the companies risk becoming monopolies. Once a corporation becomes a monopoly, it can easily leverage its large user base to deploy less ethical but highly profitable revenue schemes. But even transparent,

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257.   "The annual payment allows for Alaskans to share in a portion of the State minerals revenue in the form of a dividend to benefit current and future generations." *About Us*, ALASKA DEP'T REVENUE PERMANENT FUND DIV., http://pfd.alaska.gov/Division-Info/About-Us [https://perma.cc/CP8E-WTTY].

258.   Evelyn L. Forget, *The Town with No Poverty: The Health Effects of a Canadian Guaranteed Annual Income Field Experiment*, 37 CAN. PUB. POL'Y 283, 284 (2011) ("The distinguishing feature of the North American GAI experiments is that they were based on the idea of a negative income tax or refundable tax credit."); Evelyn L. Forget, *New Questions, New Data, Old Interventions: The Health Effects of a Guaranteed Annual Income*, 57 PREVENTIVE MED. 925 (2013), http://www.sciencedirect.com/science/article/pii/S0091743513001928 [https://perma.cc/FC9W-XSBB].

259.   Rasmus Schjoedt, *India's Basic Income Experiment*, 21 PATHWAYS' PERSP. SOC. ON POL'Y INT'L DEV. 1, 3–5 (2016).

non-monopolistic tech companies benefit from automation, prior innovation, and infrastructure—they too have a responsibility to give back.

I propose a revenue-to-employee ratio tax that increases with company size and salary divergences between average employees and upper management. This tax would be scaled to encourage growth, but limit returns on growing into an automated monopoly. It would also encourage innovation by minimizing taxes on small companies and start-ups. This proposal would generate revenue relative to infrastructural impact—large automation reliant corporations would face high revenue to employee taxes, but so would corporations profiting from selling autonomous tools or commercializing user data. The bigger, the more autonomous, and the less well distributed the internal salaries, the higher the taxation rate.

This solution might also be applied globally to make international corporate taxes less confusing. If a corporation generated significant revenue in a country employing fewer workers, the corporation would pay the country a higher tax. If a region is willing to work together, the tax could be applied across countries, for example, in the European Union, the tax rate could be a ratio of employees working there to revenue generated from the region. While this may initially seem to be a tax disadvantage to the country that houses the headquarters, it is likely that the tool would be most popular in its home country, therefore the revenue would be higher. Additionally, employees would, theoretically, keep company cash flowing into the national economy. Nonetheless, perhaps a community impact tax, determined as a ratio between employee and local salaries, could be added to supplement the regions bordering corporations. Taxes would increase the more highly paid tech employees are than their neighbors.

These ideas are meant to be starting points, and, hopefully, will induce more promising revenue schemes from those more versed in tax legislation, just as prior ideas led to this concept. This model was originally inspired by Bill Gates' proposal of a robot tax, which was laughed off by some economists as pushing back progress.[260] It is hard to determine whether physically unattached systems that run the same code on the same server and work in tandem are one machine or multiple machines. Once again, the proposal, as phrased by Gates, seemed too centered on work instead of those gaining capital through little added effort of their own.[261] Gates' proposal became a challenge to imagine a tax structure that could fiscally mirror accountability for increasing automation.

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260. Larry Light, *The Backlash Against Bill Gates' Call for a Robot Tax*, CBS NEWS (Mar. 10, 2017, 6:00 A.M.), http://www.cbsnews.com/news/bill-gates-tax-robots-luddite [https://perma.cc/3SPF-HALP] ("Numerous detractors, including Harvard economist Lawrence Summers, the former U.S. treasury secretary, have poked holes in the idea [of taxing robots], arguing it would be counterproductive. Summers asked why Gates wants to 'reduce the size of the pie' and dubbed his plan 'protectionism against progress.'").

261. Delaney, *supra* note 66 ("Right now, the human worker who does, say, $50,000 worth of work in a factory, that income is taxed and you get income tax, social security tax, all those things. If a robot comes in to do the same thing, you'd think that we'd tax the robot at a similar level.").

The greater concern, however, is how these taxes are used. Using Silicon Valley as a case study, it becomes clear that, without direction, government funds are not guaranteed to be allocated to those who need them most. Wealth generated from future automation taxes should be funneled into universal programs that uplift the standards of living for those in society who have the least, thus shortening the distance any member of society can fall and increasing the accessibility of innovation. For this, I propose a basic income program combined with market regulation (BIMR).

This BIMR guarantee would provide *a monthly cash grant large enough to accommodate the basic needs of all individuals topped with an additional fixed grant for savings*. The savings grant would be proportional to wealth generated from automation taxes. The basic needs that would be covered include food, housing, utilities, and transportation. Regions would have the option to use funds to subsidize affordable housing, transportation, and fresh food options, as long as they do not break the promise of BIMR. For example, a community could use the funds generated from the automation tax to reduce the regional cost of living. Such action would lower the amount owed to citizens with the BIMR guarantee while still providing enough cash to cover their basic needs plus extra for savings. The alternative of this example would be a community that does not practice market regulation, preferring to continually adjust the basic income amount to reflect the market dependent cost of a basic standard of living plus the fixed savings grant. Both regional decisions would be permissible under BIMR.

The exact amount individuals receive through this proposal is purposely vague. The appropriate amount of funds is both region and time dependent. Why give every American $1000 per month,[262] when one could guarantee, for the rest of time, to the cover basic needs of every member of society and allocate an additional redistributive grant each month? $1000 per month, while an *income* guarantee, is not a *security* guarantee and lacks the structure to ensure wealth redistribution. The market could simply adjust so that basic needs become higher priced and the $1000 passes through citizens' hands to return to monopolists. Guaranteeing all citizens access to a base standard of living and auxiliary funds, however, prioritizes citizens over the free market.

This system would also require a free universal medical care program and education system. The reason is two-fold. While healthcare is a human right, it

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262. Andrew Yang, founder of Venture for America, is running for Democratic President of the United States on a basic income platform, promising $1000 a month for every individual over 18. His YouTube promo informs that the basic income would be "paid for by the companies that are benefitting most from automation" and would allow Americans to "go back to school, move for a new opportunity, start their own business, and really have their head up as they plan for the future." While his plan may be more feasible in the short term, it seems insufficient for an automated future. Watch Yang's campaign video here: Andrew Yang for President 2020, *Andrew Yang for President: Humanity First*, YOUTUBE (Feb. 2, 2018), https://youtu.be/GhArPPmHjCs [https://perma.cc/K62T-BVAH]; *see also What Is Universal Basic Income?*, FRIENDS ANDREW YANG, http://www.yang2020.com/what-is-ubi [https://perma.cc/ST2W-TD32].

would be difficult to add healthcare to the basic needs covered by BIMR. Some people, over the course of their lives, require more medical services than others. If healthcare was something individuals had to pay for, then the sick, for no fault of their own, would lose their basic standard of living to pay for the right to live. Alternatively, the healthy would be doubly advantaged by receiving unnecessary healthcare funds that others must use to survive. Instead, money that would be given to cover health care costs should be saved to provide anyone free access to medical services.

Education too is a human right. Like the medical care program, citizens may desire different levels of education or choose to pursue different degrees. Rather than include education in the BIMR stipend and reward those who do not pursue an education with excess capital, that money can be saved to build academic programs for those interested in advancing humanity. Anyone should be able to pursue an education, and those who succeed, and go on to advance humanity, should be rewarded by not having to finance their education.

In the United States, such demands may seem like a dream, but universal healthcare and free schooling are already available in much of Europe. With the amount of wealth and innovation in the United States, the expense of basic needs like food, housing, and transportation can be shocking. Silicon Valley has managed to transform once million-dollar room sized computers into handheld, voice-activated, robots that tell jokes in multiple languages. Yet, somehow, the Bay Area struggles to find a place for those who work full-time jobs and are forced into RVs to dump their feces, much less an affordable housing. Capitalist driven innovation is a red herring for the capabilities and responsibilities of technology. It is time to restructure innovation so that it drives humanity forward and not just those privileged enough to afford it.

PART V – CONCLUSION

This work has mainly been to quilt together pieces of dialogue that already existed but were unconnected.[263] The goal was to reframe the dialogue around

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263.   There are limitations to this research design. First, tackling the economic responsibility of tech companies from any single lens is challenging. Building a fluid argument that incorporates automation, innovation, infrastructure, philanthropy, and policy suggestions in one piece inherently limits opportunities for depth in any single domain. Each subsection could be transformed to a book longer than this length. Secondly, "technology" is a broad field, with a public conceptualization that changes over time. Technology is by no means limited to computer science, although I do believe that a growing number of technological solutions would not be possible without some level of programming. There are, without a doubt, technologies that do not cleanly fit the paradigms presented – this should not undermine the multitude of corporations for which the examples shared in this Article are a reality.

A final challenge to completing this work was that much of the material covered was a) quite recent at the time of writing, b) private information of corporations and not publicly available, and c) cross disciplinary. This meant that there was a dearth of available academic literature aligned to this particular topic. As a result, this Article utilizes primary news sources for data. Unlike the traditional Article that build on prior scholarly studies, the research focus and scope of this project is nascent. This work

advancing technology to concentrate on its economic impact on society in a way that allowed an escape from the circular arguments often associated with automation, innovation, infrastructure, and philanthropy. In other words, the curse of automation is *not* the gray future of work, but the wealth imbalance corporate technology encourages. "The future of work" is not as essential to the conversation of wealth redistribution as increasing wealth and opportunities for some and *decidedly* not for others.

Similarly, innovation is neither inherently good nor driving the tech industry. Investment is more dependent on profit potential than humanity enhancing innovation. And publicly funded research projects have historically been essential to creating invention for the public good. For these reasons, as the Article demonstrates, "tech" is boosted from preexisting infrastructures and often fails to take responsibility for the negative conditions it creates and perpetuates. Although "tech" is marketed as infrastructure upon which humanity can succeed, unfortunately it is not consistently implemented as such. In the end, philanthropy does not undo bad behavior.

The range of tech philanthropy efforts—from "self-made" billionaires pledging to give away the majority of their wealth, to corporations promising to match employee donations, to those that give grants up to one percent of annual revenue, to corporations that do not find it within their mission to give at all—are insufficient. The common thread in most tech giving is that while there should be equality for all, choosing to give is a humanitarian choice, one where the amount and destinations of the philanthropic funds are completely up to the discretion of the organization, and not a matter of responsibility.

This rhetoric is problematic because it distracts from the fact that automation, prior innovation, corporate bullying, and infrastructural advantages account for a large amount of tech wealth. It also frees corporations from needing to fix the problems they advance. Philanthropy is a positive corporate dogma, but is not sufficient to renegotiate the funds tech corporations owe to society. A possible improvement could be taxing corporations on their employee-to-wealth ratio at increasing rates for corporation size. This tax structure could be applied internationally to lessen tax evasion loopholes. This money should be used for infrastructure that makes life affordable and for wealth redistribution to improve outcomes for everyone over time.

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