Tech Otherwise

Defund Big Tech, Refund Community

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> *"The only way I can see to deploy this much financial resource is by converting my Amazon winnings into space travel" (Jeff Bezos, Business Insider, Aug 6 2019)*

Jeff Bezos offered the comment quoted above regarding the wealth that he has acquired as Amazon's CEO and dominant shareholder.[1] Here we consider the harms produced by Amazon, along with other so-called Big Tech companies - Apple, Google/Alphabet, Facebook and Microsoft,[2] and offer a better proposal for how we might collectively redeploy their enormous revenues in the service of earthly flourishing. The Black Lives Matter-led movement against systemic racism, and the long abolitionist organizing movement in the United States,[3] provide important context for our efforts.[4] We are inspired by renewed calls to Defund the Police in the United States, which have reinvigorated vital debate regarding the funding of police departments, who is actually served by them, and what forms of historical injustice are perpetuated by current institutions of policing and incarceration.[5] In the context of the abolitionist movement, to defund means to invite local and regional communities to decide how to redirect the disproportionate funds now invested in enforcement and imprisonment to support alternative, more holistic forms of well being and public safety infrastructure.[6] In the spirit of that movement, we adapt some of its key concepts to the domain of public/community information and communications (ICT) infrastructures, particularly those now dominated by Big Tech. Our proposal is grounded on a key premise: to redirect Big Tech 's excessive revenue flow, we must transform the conditions and funding structures that enable it. The aim is to free up resources to support a wide range of socially beneficial ends, not least community-based and community-oriented initiatives to develop digital infrastructures that better serve the public interest. While we are not calling for the demise of Big Tech, we are calling for radical reform. This includes abolition of the conditions that create and normalize Big Tech's disproportionate reach over key ICT infrastructure, and their wide ranging negative consequences for society and the environment. We aim to retain — and expand — the many benefits that people currently derive from digital technologies, while better addressing their individual and collective needs.

We write at a critical historical juncture. The global Covid-19 pandemic has intensified the vital role that digital technologies play in so many peoples' lives. This has contributed directly to Big Tech's burgeoning fortunes while the rest of the economy is experiencing the worst crisis since the Great Depression. These growing wealth and informational disparities have sharpened recent calls by government and civil society to break up Big Tech's monopolistic market power.[7]

We begin with a review of the mythical, and the actual, origins of Big Tech-dominated ICT infrastructure, as well as the harms that the existing system has brought. We then discuss ways to

defund Big Tech, sketching the roles that different actors can play. Finally, we show how we might refund communities, helping them to develop and adopt ICT systems that better address their needs. We promote community tech as a way of redistributing resources to empower individual and collective initiatives in alternative infrastructure-building, many of which already exist but are starved for resources. Community tech here comprises a holistic effort to empower people with the ability to build, access and govern digital technologies that serve their interests.

I Why defund Big Tech?

The origin myth of Big Tech is familiar to most of us: Risk-seeking genius entrepreneurs start from nothing and pursue a novel idea, from creation through commercialization and production to scale. According to the logic of this myth, the venture capitalists who, against all odds, followed their ground-breaking vision should reap the rewards: they created the value that fuels the revenue. But, as we explain below, very little of this familiar narrative is true. Its endless retelling only detracts from our ability to see both the challenges and opportunities that new communication technologies present.

First, the Big Tech "visionaries" invariably started with technologies based on research at institutions that rely on significant public funding. The venture capitalists did not take most of the risk, nor did the technologists create the basis for the market valuation of their developments on their own. Instead, as economist Mariana Mazzucato (2013) and others have shown, far from getting out of the way of private innovation the State paves the way. It is the State, not private capital, that funds the long-term, high-risk research and development (R&D) that underpins Big Tech.[8] Contrary to the reigning mythology, the State has not only generated the conditions that make Silicon Valley possible, it has also financed the R&D and in many cases supported its products up to the point of commercialization. Virtually every major technology that enables contemporary digital infrastructures, from the Internet itself to the now iconic smartphone, was created by nationally funded R&D long before the technology came to market.[9]

Second, despite its pivotal role the State has been systematically deprived of the rewards generated from its own innovation investments. Decades of lobbying for deregulation have allowed companies like Apple to avoid 'paying back' a share of their profits to the same State that funded much of their success.[10] The Big Five exploit their clout to avoid paying billions of dollars in taxes, as well as fines when found guilty of offenses. In the end, the State is left with a tail of complex issues to deal with.[11]

Finally, Big Tech companies are so highly profitable because they generate economic value at enormous scale.[12] But who creates much of that value? Users. Facebook and Google sell user profiles, composed of content that was created by their users—not the company. What has value in a user profile is not the data structure, but the record of choices that users make and the content that they create. These choices, and the attention required to produce and consume them, become valuable assets for the

platforms to sell to advertisers. Everything else facilitates that value's extraction and monetization. In the case of Facebook, the company has secured a monopoly on the monetization of the value created by its users and prevents that from being shared more freely.[13] Platforms such as Twitter and Instagram similarly rely entirely on their users to create the value that makes other users engage. All of these digital spaces are permeated by ceaseless advertisement. The labor[14] of users in creating the value of these platforms can easily be counted in the engagement metrics that companies compile. To further complicate matters, the infrastructures that enable a significant proportion of the value of Big Tech's key services rest on the shoulders of an extractive, underpaid, wide network of invisible labor[15] has created a significant proportion of the value at the core of several of Big Tech's key services. A parallel situation plays out in the gig economy, in which workers are beholden to platform companies for uncertain, insecure, and temporary employment. This pipeline of labor is deeply problematic: its globally — and vastly unequally — distributed nature, across what Virginia Eubanks calls "low-rights environments," creates the conditions for a vulnerable workforce with virtually no legal frameworks for advocacy or protection.[16] On top of that, this already troubling system is not exempt from the racial and colonial shadows of the past. From the racialization of women of color within the production pipeline of early electronics, to the ethnic stereotyping of South Indian workers as fit for technology-related work, the foundations of value creation of Big Tech, and Silicon Valley more widely, inherit the legacies of racial capitalism.[17]

So, what is the problem with all of this? At first sight, the rapid growth of Big Tech indicates that these technologies are meeting some societal needs. In just a few decades, Big Tech has become part of the daily life of billions around the globe. Yet the social costs of this approach to digital infrastructure and services are far less visible.[18] Driven by a handful of individuals and shareholder imperatives, the Big Five are de facto monopolists, integrated both vertically and horizontally,[19] positioning themselves as unavoidable gatekeepers in their respective areas of specialization. This market dominance has brought on multiple anti-trust investigations, by the US Congress,[20] the Attorneys General of 50 US states and territories,[21] and the EU.[22]

But the greatest threats that Big Tech wealth poses are to democracy.[23] Similar to earlier historical periods when high concentrations of wealth threatened democratic practices, Big Tech companies use their economic power across a wide spectrum of political arenas. They are among the most active lobbyists in the communications and electronics sector,[24] pushing the passage of laws in their favor or resisting those that aren't.[25] Brazenly pressing governments for their private gain over public interests, they are often powerful enough to get away with it. In areas where regulation is weak or non-existent, they charge ahead with a 'catch me if you can' approach.[26] Given the relative novelty of their technological foundations and associated business models, key aspects of Big Tech operations are often arguably at the margins of or even outside conventional legal jurisdictions and regulatory regimes.[27]

Foremost within the tech industry, the Big Five typically claim that any constraint on their actions would 'stifle innovation,' threatening vague but ominous societal costs.[28] They conveniently ignore the possibility that their innovations may be harmful and too often are.[29]

As many have pointed out, the fine-grained capture, analysis and exploitation of personal information to influence behavior on a population-wide scale in the pursuit of private commercial interests constitutes a dangerous form of what scholar Shoshana Zuboff (2018) refers to as 'surveillance capitalism'. Monetizing the personal information and attention of their users has proven to be so lucrative for advertising-reliant tech companies that they have gone beyond developing features that provide value for users and have systematically designed their services to be 'addictive'.[30] Employing techniques from behavioral psychology that operate subconsciously, these companies 'hook' people into acting in ways that serve their commercial advantage. This can have deleterious effects for the individuals concerned, eroding their agency and autonomy. Most notably, these practices have contributed to people being subjected to political manipulation.[31]

In addition to the familiar ways in which large corporations have long sought to influence political processes, Big Tech's novel business models, which rely to varying degrees on exploiting the personal information and communications of their users, introduce new openings for the disruption of conventional governance. The most prominent example is the controversy over the damaging role that social media plays in elections, witnessed recently with the storming of the United States Capitol. Facebook is currently the biggest public villain, tarred with the Cambridge Analytica scandal and for enabling hateful speech and inflammatory (mis)information to circulate widely and rapidly on its networks, especially during contentious elections.[32]

To compound the problems of mass surveillance, rather than reining in Big Tech's bulk collection and exploitation of personal information, governments have sought to take advantage of their massive data stores and big-data analytic capabilities for State security intelligence purposes, foreign and domestic.[33] As Edward Snowden has revealed, the US National Security Agency (NSA) has taken the lead in this regard. Its PRISM surveillance program, in which at least four of the Big Five companies formally participated, was reportedly "the number one source of raw intelligence used for NSA analytic reports."[34]

One disturbing result of Big Tech's infrastructures becoming an arm of the state is the use of pervasive surveillance to exacerbate the long-term mass incarceration crisis in the United States. Facial recognition, predictive policing and risk profiling algorithms, among other carceral technologies, serve as mechanisms that reproduce a long history of racial policing and discrimination both in the United States and abroad. These technologies are leveraged as weapons "used by law enforcement to identify, profile, and enact violence against categories of people" (Hamid, 2020). These techniques are further

fine-tuned and normalized through unwitting participation of the public via consumer products, such as biometric identification on smartphones.

There are further, less direct but no less potent ways that Big Tech enterprises play an outsized role in governance. As forceful promoters of *technological solutionism,*[35] prioritizing technological answers to a broad range of social, economic, political and environmental questions facing contemporary society, they marginalize less intensively technological but possibly more appropriate responses.[36] Even where digital technologies can play an appropriate role, Big Tech overly constrains the viable options. For example, instead of treating personal information captured during on-line interactions exclusively as a proprietary corporate asset to be monetized in various ways,[37] with appropriate consideration of subject rights, that information could be viewed as a collective or common asset, to be managed through data trusts or cooperatives for public benefit.

Big Tech companies that rely on advertising erode democratic governance as well in their undermining of an indispensable feature of democratic deliberation, independent professional journalism.[38] As Google and Facebook capture a large and growing proportion of advertising revenues, they deprive conventional news media of the income that supports their reporting[39] and they typically refuse to underwrite the cost of producing the news content that attracts people to their platforms. Moreover they allow users to post excerpts of news on their platforms without properly compensating publishers. As a result, publishers' find themselves drawn into an advertising business model that has serious consequences for independent journalism, and in which the news media that have safeguarded democracy for centuries are starving.[40]

In sum, Big Tech has shown that digital technologies can offer significant social value, but in a remarkably short period of time the industry has also developed practices that now threaten the capabilities of democratic governance. This brings us to our call for defunding, to ensure that digital technology serves the public interest.

II Defunding Big Tech

In the spirit of the anti-racist defund campaign, we propose to extend the project of resource redistribution to the domain of public infrastructures, and more specifically to the processes through which vital information and communication technologies are developed. In keeping with Ron Deibert's (2020) and Cory Doctorow's (2020) recent calls to restrain the forces of surveillance capitalism, we focus first on curtailing the power of Big Tech, while recovering resources currently contributing to its hold on our information and communications infrastructure (defund), which can then be redirected to community-oriented services (refund). These changes will require initiatives on the part of multiple actors, starting with Big Tech itself.

Big Tech (and other tech businesses):

The major tech companies need to take seriously the legitimate concerns about their excessive power and harmful impacts increasingly being voiced by actors across the social, political and economic spectrum. In particular, Big Tech companies need to:

– *Pay their fair share of taxes.* Lost revenues through tax avoidance by Silicon Valley's largest companies (Facebook, Apple, Amazon, Netflix, Google and Microsoft) exceed $100bn globally over the past ten years.[41]

– *Stop secretive lobbying and other behind-the-scenes efforts to prevent regulation.* While some degree of lobbying is legitimate, it must be conducted in full public view.[42]

– *Provide public transparency* regarding privacy policy, surveillance practices, data trafficking, political campaigning on social media, and environmental impacts (energy consumption and sources).

– *Offer API (Application Programming Interface) access* to core functions compliant with open standards to enable interoperability with alternate service providers.

– *Support the right to repair.* If we cannot sustain the functioning of our devices, we cannot ensure they are used to the full.[43]

History has proven that Big Tech will not take these measures simply on their own initiative. Collective action on the part of civil society and government will be required to exert the pressure and regulatory force that can reshape Big Tech priorities and modes of operation.

Governments and Policymakers:

Government has the primary responsibility to promote the public interest, as well as being the only institution with enough legitimacy, authority and resources to hold Big Tech to account, especially to the degree that it works in concert with civil society. Elected public bodies must act decisively and collaboratively across jurisdictions to regulate Big Tech, require those corporations to pay fair taxes, and through their procurement and contracting powers foster a tech sector that sustainably meets people's information and communication needs. In particular, governments and policymakers need to:

– *Revive antitrust laws to break up monopolies and uncouple anti-competitive mergers,* to enable more competitive markets and rein in excessive political influence.[44]

– *Designate large tech platforms as 'Platform Utilities,'* prohibiting Big Tech from owning and monetizing both the platform and its users.[45]

– *Require platform interoperability*, including to facilitate 'identity portability'[46] to enable alternative business models, including non-profit ones, to emerge without holding users captive.

– *Extend producer responsibility* to mitigate environmental harms and to support repair versus planned obsolescence.[47]

– *Establish and enforce a reasonable tax regime based on out-sized corporate profits or financial transactions* or both, as well as other approaches that refund community.[48]

– *Roll back mass state surveillance,* particularly where it depends on secret and unaccountable government access to personal data held by platform providers.[49]

– *Establish strong international privacy and other digital rights regimes,* robust enough to effectively protect individuals as well as to help abolish the surveillance capitalism business model.[50]

– *Reduce dependence of public institutions on Big Tech.* Across several sectors, notably defense, government services and education, governments have come to rely heavily on Big Tech services, making it harder to rein in their excesses.[51] Instead, public institutions could leverage their collective power in order to develop their own services, or support the development of alternative community-governed services that are not controlled by Big Tech.[52]

– *Consult and collaborate with professional organizations*, like the Association for Computing Machinery (ACM), workers and organized labor, advocacy and human rights groups, environmental groups and others to ensure that all voices are heard and that important local knowledge is considered when developing tech policy.

– *Consult and collaborate with other governmental bodies*, including towns, cities, and regional as well as national, international, and supranational bodies to help ensure that fair, prudent, and non oppressive digital policies are not just enjoyed by a privileged few.

Tech professionals/workers, researchers and their organizations:

As the people most knowledgeable about Big Tech operations, as well as those workers whose labors are essential for Big Tech's ongoing viability, tech workers have an especially important, transformative role to play. Many entered the industry with high expectations about the contributions they could make to social betterment, but have since become disillusioned.[53] While tech researchers are more removed from operations, they too can offer well-informed insights. Working together, these groups need to:

– *Organize to oppose egregious Big Tech behaviour,* drawing on already successful efforts.[54]

– *Refuse sponsorships* from companies violating criteria for good business practices.[55]

– *Work within professional organizations* to ensure that these issues get the attention they deserve.[56]

– *Educate technology students* about the dangers of Big Tech and how to take responsibility for the systems that they develop.[57]

– *Support professionals worldwide who bring tech abuses to light* and encourage community tech.[58]

– *Use their technological expertise and social imagination to work with people in the community* as well as with government officials and civil society organizations, to envision, design, build, and manage alternatives to Big Tech and other mainstream corporate approaches.[59]

Civil society organizations and social movements:

It is often civil society organizations (CSOs)[60] and social movements that lead governments to act in the interests of the people they are supposed to serve, and then keep pushing to ensure that they do the right thing. They act as expert watchdogs, policy entrepreneurs and a primary vehicle for effective mobilizing, pressuring corporations and governments into action. While there are many CSOs active in the tech/digital rights field, so far there is not the same degree of social movement mobilization that other areas, such as racial justice and environmental sustainability, have attained. Here are some actions that could be taken:

– *Closely monitor Big Tech and hold it to account* in such areas as market competition, civil liberties, accessibility, labor and environmental sustainability.[61]

– *Consider alternatives to Big Tech platforms* for communicating with supporters, organizing events, and publicizing issues.[62]

– *Cooperate with community members, tech workers, and others in developing and implementing approaches* that improve the effectiveness of their efforts without sacrificing their ideals.

– *Work with other organizations and networks around the world* to ensure that tech companies and governments are using tech responsibly.[63]

We as individuals (consumers, business, investors):

If we want to abolish the conditions that lead to Big Tech harms while redirecting technology development towards a more just and sustainable future, individual actions, however small, that are commensurate with our skills, means and fields of expertise can cumulatively contribute to significant changes. Many of us are in a position to withhold both the personal information and money that Big

Tech relies on, and to re-direct them more positively.[64] Here are some steps to take, which are more effective when made in concert and collectively:

– *Insist that governments serve their role as defenders of human rights and advocates for the public interest* in pursuing the actions identified above, as without this pressure they will likely fail to do so.[65]

– *Recognize that no computing comes without cost, even when offered 'for free'.* We pay collectively for advertising supported services through higher consumer prices. As noted above, we need to consider a host of other hidden costs as well, in terms of democracy, privacy and other civil liberties, and environmental sustainability.

– *Resist Big Tech surveillance practices*, by using alternative, preferably open source services for search, browsing, emailing, messaging, video conferencing, ad blocking, and web tracker blocking, and mapping.[66]

– *Boycott advertising on Facebook and other platforms* that harm democracy and otherwise act egregiously against the public interest.[67]

– *Subscribe to, and when feasible pay for, high quality journalism and other informational resources,* rather than simply accessing them through platforms that redistribute content for free without fairly compensating the source.

– *Support and work with civil society organizations in their anti-surveillance efforts and other efforts to shape democratic technology.*[68]

– *Exercise our democratic rights and responsibilities,* e.g. freedoms of expression, communication, privacy, and assembly.

There is growing public support for reining in the power of Big Tech. Anti-trust initiatives are leading the way, with the goal of breaking up the giants and better regulating the industry. However, while these are urgent, vital measures, we need to look well beyond simply allowing the Big Five's smaller competitors to participate in digital markets that remain driven by conventional business models.[69] There is currently a rare window of opportunity to consider how these enormous revenue flows can be put to re-orienting technology development to better serve much wider societal aims.

Photo courtesy of the Participatory Budgeting Project. participatorybudgeting.org

III Refunding Community

The principal purpose of defunding Big Tech is to reduce its out-sized power and redirect its excessive revenue flows toward better serving human needs. There are many entangled areas of societal crisis that call for priority treatment, including the climate emergency and environmental protection, democratic reform, social in/equality (e.g. resolving economic, class, racial, gender disparities), and criminal justice reform, to name the most prominent. Without challenging these vital claims for resources, we focus here on technology developments aimed at meeting people's diverse information and communication needs while remaining under community control. We refer to this broadly as *community tech*.[70] We highlight what refunding would look like with regard to key digital technological infrastructures and services. By their infrastructural nature, these technological developments can assist in remediating the multiple crises mentioned above.[71]

Inspired by projects that imagine an Internet based on radically different foundations,[72] here we identify the kinds of community based tech initiatives that would benefit from a redistribution of Big Tech revenues and contribute to re-imagining digital infrastructures. Central to defunding/refunding is a radical democratization of ICT design and governance, drawing on funding models oriented to public well-being rather than private profit.

The aim of these initiatives is not only to retain but also to expand the benefits that people currently derive from digital technologies, while better serving both their individual and collective interests. This process begins with the recognition that many millions of people rely daily on Big Tech's services (e.g. search, email, social networking, news gathering and sharing, mapping and way-finding), making them in effect infrastructural utilities. Like prior utilities such as water, electricity and

telecommunications, we cannot allow our digital infrastructure to be operated by unfettered monopolists. Instead, they need to meet public interest criteria[73] that include being governed and brought to democratic accountability as public utilities, so that all can enjoy them freely and equitably while helping to shape their direction. Beyond this, community actors also need open access to these digital infrastructures in order to develop new, potentially alternative services attuned to emerging or more localized needs. This vision of community tech represents a hybrid of classic public utility governance of societal infrastructures, and community-led innovation.

Community tech development well precedes the commercialization of the internet and the emergence of Big Tech in the late-1990s. Indeed, key innovations on which Big Tech enterprises have built their empires originated as non-profit, community initiatives in the mid-1970s[74] and reached their zenith in the mid-1990s, when over 100 community networks[75] around the world were organizing with each other and providing digital services to all, generally without cost and free of surveillance.[76] While the community tech sector continues actively to this day, with few exceptions[77] community-oriented initiatives remain relatively marginal due to a lack of resources. While tech startups that succeed in providing widely appreciated services can expect to thrive, non-profit ventures that are similarly successful in demonstrating their social value still face a nearly insurmountable hurdle in achieving sustainability. This is largely because they lack a revenue model comparably lucrative to their for-profit alternatives. Just as major public institutions founded on print media in an earlier era, such as schools, libraries and the postal service, would not exist without significant, reliable public funding, initiatives now emerging in the digital era that efficiently produce analogous public/common goods[78] should receive comparable support. To accomplish that, funds diverted from current Big Tech subsidies and other revenues should be redirected through a democratically governed public purse to sustainably support essential digital services for all,[79] experimentation by the community tech sector to develop new services, and successful initiatives that offer valued public/common goods. In terms of understanding the risks and the opportunities related to information and communication systems, there has never been a better time to establish public institutions appropriate for the distinctive needs and media of the 21st century.

Refunding community implies assuming greater shared responsibility for all aspects of the technology life-cycle, from concept and design to deployment, redesign, repair and retirement. All refunding community work should consider education as part of its mission, including how technology works and how to work with it, but also critical thinking with respect to its social implications. This includes identifying and communicating the real costs of tech and potential future harms, and sponsoring conversations around tech workers and working conditions.

There are now thousands of new projects that support various aspects of democratic decision-making including discussion, deliberation, service design, information sharing, local news aggregation, DIY

media, decision-making, environmental monitoring, government transparency, and participatory budgeting. One of the challenges is providing the resources and the institutional infrastructure to keep these projects thriving. The City of Seattle, for example, established a Citizens Advisory Board on Technology (CTAB) that, among other duties, makes small grants to neighborhood tech projects. At a larger scale a Corporation for Public Software entity has recently been proposed that would help ensure that public software, especially deliberative systems, would find a secure place in the public sphere.[80] Civic hacking events develop public data and digital applications for civic uses. The Ideas for Change consultancy has developed large EU projects that use participatory design and digital technology such as sensing technology to help people take an active role in improving their city. Barcelona, Spain, is home to a wide variety of innovative community and civic tech projects including Barcelona Ciutat Refugi (Barcelona Refugee City) to help address the humanitarian crisis of millions of displaced people.

At the same time, grand initiatives by Big Tech players to make cities or regions 'smart' deserve critical scrutiny, especially proposals that sideline residents. Some of these efforts attempt to shift important public responsibilities into private hands. Many make impossibly confident claims, provide minimal transparency, and hoard public data for their private gain. Local resident organizing has in some cases been effective in halting such projects and opening up possibilities for more genuinely participatory urban planning that takes advantage of digital technologies in ways that reflect local resident needs and aspirations.[81]

One notable effort offering freedom from Big Tech domination is DECIDIM, a free and open source system for a variety of participatory governance approaches, which is now being used or tested in cities around the world including Barcelona, Milan, Helsinki, and Mexico City.[82] Moreover, groups and governments around the world such as the International Federation of Red Cross and Red Crescent Societies[83] are working to share data to help implement smart systems for the common good.[84] Recent proposals on the development of data cooperatives, trusts and stewardship models[85] are paving the way to community-first data paradigms. Some have recently developed technology in ways that benefit communities, such as Sentilo and DECODE in Barcelona, which focus on urban sensors and making data generated available for public benefit,[86] or Telecomunicaciones Indigenas Comunitarias focused on public communications infrastructure in México.[87] Others such as Free Geek and Reboot Canada focus on recycling hardware to help provide affordable computing in communities promoting a range of social equity goals.[88] We Don't Have Time is a movement and a tech startup that leverages the power of social media to hold leaders and companies accountable for climate change. Many other community tech initiatives worthy of support could be mentioned.

Where conventional forms of democratic decision-making are found inadequate for tackling thorny policy challenges, such as the climate crisis and electoral reform, people have turned to citizens'

assemblies[89] as a more popular form of collective deliberation around controversial issues. Citizens' assemblies may also be suitable for proposing, assessing and recommending strategies for technology development that can be relatively free of the Influence of Big Tech interests and technological solutionism more generally.[90] Even more modest public forums, such as debates between contending advocates and questioning of experts, can help people to understand the technological options and limitations of technological solutions for issues of concern, otherwise obscured by Big Tech promotions.

IV Another Tech is Possible

The current mobilization around police violence and systemic racism in the United States reminds us of the deep oppression that has been woven into the social and technological fabric of regions and countries worldwide. Refunding communities will help to strengthen organizations that deploy technologies to acknowledge, support and assist individuals and communities who live with systemic discrimination, oppression or violence. At the same time we know that humankind faces other profoundly serious problems including climate change, pandemics, authoritarianism, and war. For that reason, one critical objective of refunding communities is to support organizing around shared issues. It is vital that we develop coalitions that sustain widely used essential digital infrastructures and foster cooperation among communities, throughout not only the United States but the world.

By allowing corporations and governments to establish the rules regarding technology we have neglected the possibilities for expanding our own agencies, while many using these technologies are adversely affected by them. Resisting the capture of our information and communication infrastructures and redirecting resources to community-oriented and community-based initiatives becomes both more critical, and increasingly difficult, as technology is embedded more deeply, more thoroughly, and less transparently into our minds and bodies, our homes and cities, and the living environment. Now is the time to radically redirect the future of tech, by reclaiming the purposes of technology development, and redistributing the associated responsibilities and benefits, in the service of our collective and sustainable well being.

About the Authors

This article was conceived at a workshop at the 2020 Participatory Design Conference (PDC) entitled "Computing Professionals for Social Responsibility: The Past, Present and Future Values of Participatory Design." One of the contested topics there was whether a new Computer Professionals for Social Responsibility (CPSR), which helped to provide a big tent for issues related to computing in society from 1983 to 2013, should be re-established, or whether working for a coalition with existing efforts was now a better choice. The verdict is still out on that. In the meantime, the authors undertook this statement as a step toward the larger goal of critically addressing the significant computing challenges facing contemporary society.

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Appendix - Big Tech's Financial Power

	Market cap 2020	**Market cap 2019**	**Increase in 2020**	**Revenues 2020**	**Earnings 2020**	**Founders net worth and world rank 2020**
Amazon	$1,592B	$920B	73%	$348B	$22B	Jeff Bezos $184B (#1)
Apple	$2,242B	$1,288B	74%	$275B	$70B	Steve Jobs (d. 2011)
Facebook	$779B	$585B	33%	$78B	$30B	Mark Zuckerberg $98B (#4)
Google/ Alphabet	$1,165B	$921B	26%	$188B	$40B	Larry Page $68B (#10) Sergey Brin $66B (#12)
Microsoft	$1,683B	$1,200B	40%	$147B	$59B	Bill Gates $115B (#3) Paul Allen (d. 2018)

Totals	***$7,461B***	***$4,914B***	***52%***	***$1,036B***	***$221B***	***$513B***

Market capitalization, sometimes referred to as Market cap, is the value of a publicly listed company. Figures for Revenues and Earnings are based on the latest reports for the trailing twelve months (TTM). Revenues are the total amount of income that a company generates by the sale of goods or services. Earnings are revenues less expenses, before interest and taxes (EBIT).

All dollar amounts in US billions.

Source for Market capitalization, Revenues and Earnings: https://companiesmarketcap.com/

Source for Founders' net worth and world rank 2020: https://wealthygorilla.com/

Footnotes

1. Wendy Liu. *Abolish Silicon Valley: How to Liberate Technology from Capitalism. p. 107.* (Liu, 2020). Already the richest person on the planet, Bezos' wealth reached an estimated $200 billion as of August 29, 2020. ↩
2. The term 'Big Tech' (aka 'Big Five') typically refers to five US technology companies, Google/Alphabet, Apple, Facebook, Amazon and Microsoft (GAFAM), that by *PC Mag*'s definition exercise 'inordinate influence'. Their market capitalizations at the beginning of 2021 were in the range of $700B+ (FB) - $2.2T (Apple) and totaled in excess of $7 trillion. Their founders are among the wealthiest individuals alive. See Appendix - Big Tech's Financial Power.

   Along with comparably sized Chinese tech giants Tencent ($709B) and Alibaba ($634B), they constitute 7 of the 10 largest corporations worldwide, by market cap. While we recognize that the Chinese big tech companies have comparably large valuations and market dominance, and that they also pose significant threats, we focus on the US Big Five companies in this statement. ↩
3. This is a movement pioneered by Black women since early in the 20th century, as Keisha Blain's recent article narrates. The arc of this work is led and embodied in the present by groups like Sisters Unchained, Families for Justice as Healing and #8toAbolition to mention just a few. ↩
4. In particular, it is fundamental to acknowledge Big Tech's disproportionate injury to gender non-conforming, Black, Indigenous and People of Color (BIPOC) populations. This injury is further exacerbated by the need for systems to support and enable capitalism, such as the prison and military industrial complex. The racial origins of capitalism, as articulated by Ruth Gilmore Wilson (Gilmore, 2002) and Joseph E. Inikori (Inikori, 2020) among other scholars, contextualizes why

technologies enabling capitalistic goals run the risk of mirroring or serving racialized goals. These technologies include race-based discrimination on algorithmic loan pricing decisions, use of platforms for purposes of anti-muslim violence,racialized predictive policing, racialized advertisement and racialized search results (Noble, 2018) among others. ↩

5. In the case of the police, the strongest position within the debate argues for the abolition of policing, as a continuation of the unfinished project of transformation begun with the abolition of slavery, in favor of investments that would reduce violent crime and support alternative forms of justice. ↩

6. As Mariane Kaba (2020) urges, "We should redirect the billions that now go to police departments toward providing health care, housing, education and good jobs. If we did this, there would be less need for the police in the first place." As summarized by former US Secretary of Labor Robert Reich (2020) in *What Defund the Police really means: replacing social control with investment*: "Social-control societies put substantial resources into police, prisons, surveillance, immigration enforcement and the military. Their purpose is to utilize fear, punishment and violence, to maintain what they consider order. Social-investment societies put more resources into healthcare, education, affordable housing, jobless benefits and children. Their purpose is to free people from the risks and anxieties of daily life and give everyone a fair shot at making it." More recently, and directly related to the position set out here, there has been a call to defund social media. ↩

7. See for example the American Economic Liberties Project as well as the many other sponsors of the Breaking the Power of Big Tech Event, Sept 1, 2020. ↩

8. As Mazzucato notes, referring to Steve Jobs' famous speech: "finding what you love' and doing it while also being 'foolish' is much easier in a country in which the State plays the pivotal role of taking on the development of high-risk technologies, making the early, large and high-risk investments, and then sustaining them until such time when the later-stage private actors can appear to 'play around and have fun" (Mazzucato, 2013 p.111-2). ↩

9. Mazzucato (2013, Chap 5) specifically identifies microprocessors, dynamic RAM, micro hard drives, LCDs, Lithium-ion batteries, digital signal processing, the Internet, HTTP, HTML, GPS, multi-touch, and even AI-based voice-user interfaces as key smartphone component technologies originally developed largely with State support. ↩

10. Mazzucato (2013 p. 196) also shows in detail that Apple has neither contributed a fair share in taxes nor created the wealth of high-paying jobs it claims to have created. She writes, "in 'new economy' sectors, companies like Apple reap the benefits from State-funded technologies, as well as

State-funded risk finance, and then pay hardly any tax which could be used to fund future 'smart' technologies. Where is the future in such a system of socialized risk and privatized rewards?" ↩

11. One example is the current housing crisis and gentrification more generally, managed in several cases by local governments, and driven by predatory behavior of the technology sector over real estate. ↩

12. Value has multiple meanings. Here it means exchange value, that is, what someone is willing to pay money for. What we mean by economic value here is is what generates income and profit. ↩

13. For example, currently Facebook users cannot share their postings with non-Facebook users. Although it is the users who created the majority of contents in Facebook, it's hard for them to transfer their contents freely to other platforms. To resolve the platform lock-in and promote competitions, Joshua Gans (2018) proposed the idea of "identity portability," which allows individuals to have rights to move their data to other platforms without permissions. ↩

14. Hamid Ekbia and Bonnie Nardi (2017) refer to this computer-mediated labor as "heteromation," a new division of labor that has arisen with little or no monetary compensation. Providing data via social media is one mechanism for turning labor into free or cheap labor. They describe many other ways to create heteromated laborers such as self-service, volunteer work (e.g., citizen science), microwork (Amazon Mechanical Turk), writing online customer reviews, etc. See also Gray and Suri (2019). ↩

15. We use invisible labor in two ways: to describe the labor required to manufacture hardware, and the labor involved in making Big Tech services run on that hardware possible. In their analysis of the labour embedded in the production of the iPhone 6, Vijay Prashad and team at the Tricontinental Institute for Social Research (Tricontinental, 2020) highlight the extractive nature of this production line using a rate of exploitation analysis. Similarly, Veena Dubal (Dubal, 2017) has studied the extractive labour dynamics maintained by companies within the gig economy through artificial worker classifications such as employee and independent contractor. Gray and Suri (2019, p. 7-37) adds to this problematic landscape by shining light over the massive hidden, often vulnerable workforce behind several core informational services such as forum moderation, content translation, and spam filtering, as well as the labour behind a number of the gig economy services as we know them. ↩

16. Political scientist Virginia Eubanks defines low-rights environments as "poor communities, repressive social programs, dictatorial regimes, and military and intelligence operations where there are low expectations of political accountability and transparency" (Eubanks, 2014). She illustrates this case by showing how military weapons such as Long Range Acoustic Devices (LRADs)

were developed by US contractors in response to unrest in Yemen, and later used domestically during protests in Pittsburgh in 2009. ↩

17. The term racial capitalism was coined by Cedric Robinson (1983/2000), to underscore the relations of race and economic exploitation. In her study of the contributions of Navajo women to early electronic manufacturing, Lisa Nakamura (2014) describes how these women were preferred for electronics manufacturing based on their gender and race, in a labor exploitation process maintained by equating creative cultural skills such as weaving with the assemblage of electronics. Biao Xiang on the other hand, dissects the anatomy of India-based IT labor through the practice known as "body shopping" where middlemen source workers to IT projects while creating an extensive network of racialized labor (Xiang, 2007, p. 39-52) ↩

18. See also Economic Liberties' "*Ledger of Harms*". ↩

19. Or at least oligopolists, a close variant with similar harms — notably creating high barriers to entry (mainly by acquiring or crushing potential new entrants), controlling prices, and collecting 'monopoly rents' (i.e. obtaining extra revenues due to their advantageous market position). ↩

20. In June 2019 the US House of Representatives Judiciary Subcommittee on antitrust began their 16-month investigation into competitive practices at Apple, Amazon, Facebook and Google. During hearings, the committee repeatedly asked the CEOs of four of the Big Five companies about anticompetitive conduct, particularly with regard to unfair behavior over digital marketplaces and predatory acquisitions, their relationships with the military, their role in political bias, and the nascent partnerships among them to expand their control over the markets they participate in. See Amazon, Apple, Facebook and Google grilled on Capitol Hill over their market power (Romm, 2020) For example, committee chair Cicilline noted that Zuckerberg's "acquisition of WhatsApp and Instagram were part of a play to both buy a competitor and maintain his monopoly power, or dominance". Both the hearings and the dozens of documents released by the U.S. House by the committee revealed the excessive power these companies possess and the ways they continuously exercise it. The Committee released its final report, *Investigations of Competition in Digital Markets*, in October 2020. ↩

21. In 2019, 50 U.S. states and territories announced broad antitrust investigations of Google (Romm (2019). The US Department of Justice launched the first lawsuit to arise from this investigation, alleging that Google uses anti competitive tactics to preserve a monopoly for its flagship search engine and related advertising businesses - Kendall and Copeland (2020) "*Justice Department Hits Google With Antitrust Lawsuit*". In December 2020, the U.S. government and 48 states filed antitrust lawsuits seeking to break up Facebook. ↩

22. Since 2010, the European Union has launched three separate antitrust investigations into Google, with total fines exceeding €8 billion, even before the recent investigation of its $2.1B purchase of Fitbit. ↩
23. Though we note as well that the wealth accumulated by many of the founders of Big Tech also leads to emissions far beyond that of the average citizen, adding to the industry's more general environmental threat: https://www.oxfam.org/en/press-releases/carbon-emissions-richest-1-percent-more-double-emissions-poorest-half-humanity ↩
24. See OpenSecrets.org directory of lobbyists in communications and electronics, among other sectors. ↩
25. TechInquiry has developed an explorer to browse public lobbying records, e.g. https://techinquiry.org/explorer/search/?text=google ↩
26. This has been the approach not just of the Big Five, but of those platform companies touting themselves as 'sharing economies' (on the term, see Martin 2016). The reports on Uber's Greyball program (NYT, Guardian) illustrate a particularly extreme example. Uber also refused to comply with legal orders to remove self driving cars from the road (BBC) and threatened to cease services in California in response to Assembly Bill 5. The NYT called it "a defiant reaction to a judge who ordered the companies to reclassify their drivers as employees." Uber went on to join forces with Lyft and other gig economy companies in spending over $200 million in the November 2020 elections to successfully pass California Proposition 22, exempting them from classifying drivers as employees. In Canada, food delivery service foodora shut down operations shortly after its delivery drivers voted to unionize, following the Ontario Labour Relations Board's rejection of the company's argument that its drivers were not employees, but contractors (CBC). This disregard for equity and justice is even more concerning as governments on various scales are persuaded to give up more of their own authority and resources. For example, Ontario town Innisfil has replaced its own public transport system with Uber subsidies in a highly questionable move (Toronto Star, Guardian), and the conservative provincial government is pushing further in this direction (Toronto Star) in an illustration of the loss of public goods to technology. See also Calo & Rosenblatt (2017). ↩
27.

There are many examples. As multi-faceted global enterprises, the Big Five can cherry pick the most favourable jurisdictions for conducting various parts of their operations while evading close scrutiny. In the tax arena, a well publicized case is Google's use of the notorious tax loophole known as the *"Double Irish, Dutch sandwich,"* which reportedly involved moving over $45B through its Dutch holding company to Bermuda in 2017-2018. Google has since said it will discontinue this particular practice, but its financial transactions remain obscure. Ireland's relatively weak data protection regime has helped make it a favoured location for Big Tech companies European headquarters. Of the Big Five, all have located their EU HQ in Dublin except for Amazon, which chose tiny Luxembourg.

With governance norms for digital services/infrastructures more generally still in their early formative stages, Big Five companies have been relatively unfettered so far, even where their activities overlap with more conventional telecommunications and broadcasting regulations that matured with analog technologies. For example, social media represents a hybrid of both forms of communications, but has been free of the carriage-content separation requirements central to common carrier regulations in telecommunications, and is only just recently, mainly in the case of Facebook, being challenged to take responsibility for the publicly available content on its platform, as broadcasters have long been required to do.↩

28. For example, the Washington Post reports on a campaign in which Google claimed that Australians may no longer be able to search for free because the government planned to introduce mechanisms to require Google to pay for their use of news content in ad revenue. The legal operations, threats and public campaigns of companies like Uber and Airbnb against regulation are out of the same playbook and pit its users against its contractors. Just recently, Facebook went as far to publicly threaten to pull out of Europe if the Irish data protection commissioner enforces a European court of justice ban on sending personal data to the US. ↩

29. For instance, potential bias on facial recognition algorithms was either downplayed or unacknowledged prior to the *"Gender Shades"* report by Buolamwini & Gebru (2018) and similar reports benchmarking commercial algorithms on the basis of skin color. Charlton McIlwain's (2020) and Joanna Bryson et al. (2020) recent pieces summarize several collisions between Big Tech's products and issues of race and gender respectively. ↩

30. 'Addiction' is used here in the colloquial rather than clinical sense. For various perspectives on how social media companies have developed and exploit techniques for holding and monetizing user attention, and their social implications, see Adam Alter (2017) *Irresistible: The Rise of Addictive Technology and the Business of Keeping Us Hooked* and Siva Vaidhyanathan (2018, 2019). The Netflix documentary *The Social Dilemma* features former tech insiders with close association with the development of manipulative techniques who have turned critics and reformers of these practices.

Zuboff (2019, pp 450-451) discusses how social media companies, Facebook in particular, have adopted techniques from the Las Vegas gambling machine industry, documented in Natasha Schüll's 2012 *Addiction By Design*.↩

31. There is debate over the extent to which social media giants' sophisticated techniques can hold their users in thrall. In his latest book, *How to Destroy Surveillance Capitalism,* Cory Doctorow (2020) argues that these companies overstate their abilities to shape or predict users' future behaviour and that it is often people's traumatic material circumstances that make them so vulnerable to political manipulation. ↩

32. *"How Cambridge Analytica Sparked the Great Privacy Awakening"*. ↩

33. A report by the Latinx and Chicanx justice advocacy group Mijente, the National Immigration Project, and the Immigrant Defense Project show how Amazon and Palantir services enable the Department of Homeland Security (DHS) to exert unprecedented levels of surveillance over immigrant communities. The *Intercept* reports that U.S. Customs and Border Patrol (CBP) has contracted to use Google Cloud technology for surveilling the U.S.-Mexico border. See: Fang and Biddle (2020). Similarly, a report by Jack Poulson dissects contract relationships between companies like IBM, Microsoft and Hewlett Packard. The report reveals these companies' close relationship with the US Department of Defense (DoD), the DoD strategies to pressure tech companies to interface with them, and the normalization of human rights suppression in the tech industry aided by contractors such as Microsoft and IBM. ↩

34.

NSA documents identify Microsoft (Hotmail, Skype), Google (Gmail, YouTube), Facebook and Apple among the 7 corporate participants in the PRISM program prior to Snowden's 2013 revelations.

NSA Slides Explain the PRISM Data-Collection Program. *The Washington Post*. ↩

35. See *Evgeny Morozov: 'We are abandoning all the checks and balances.* The Guardian, 2013. ↩

36. Big Tech promotion of 'smart city' technologies for addressing the full spectrum of contemporary urban issues offers a prominent illustration of technological solutionism. This is perhaps most vividly seen in Google's Sidewalk Labs subsidiary's failed foray into futuristic city building in Toronto. More recently, Google and Apple jointly provided an example of technological solutionism in their collaborative advancement of smartphone apps for Covid 19 tracking based on their Exposure Notification API. See *Canada's COVID Alert app is a case of tech-driven bad policy design* (Haggart, 2020). ↩

37. Kean Birch and Fabian Muniesa (2020) note that "[...] assetization, as a process, is a combination of capture and repurposing." They add "Cookies are a good example of the infrastructural dimension of assetization: a simple mechanism initially aimed at filling online baskets has little by little been invested and overloaded by marketing professionals, who have built upon it complex and intricate market data-based infrastructures for data-related goods (ad exchanges, real-time bidding, etc.)" ↩

38. Since Google and Facebook revenues derive overwhelmingly from on-line advertising ($96B/70% and $55B/99% respectively in 2018), they depend most on monetizing personal information, but to a lesser extent all the others do too. See *How the Tech Giants Make Their Billions*, (Desjardins, 2019). In 2019, "Google and Facebook accounted for over 60% of all U.S. digital advertising spending, and 33% of all U.S. advertising spending." These figures cannot be accounted for simply by the popularity of their services, but also in part because they can charge a significant premium in their advertising rates. This is due to Google's and Facebook's ability to know, "with near perfect certainty, the identities of their users," and hence target ads at individuals and groups more accurately than services that cannot take advantage of this personal information. *Identity crisis: Why Google and Facebook dominate digital advertising*. (Moore 2020) ↩

39. See *Tech Companies Are Destroying Democracy and the Free Press*, (Stoller, 2019). ↩

40. A report (Penelope Muse Abernathy, 2018) of the declining diversity, quality and accessibility of news sources in the U.S. noted that "...in even the smallest markets, as much as 75 percent of the digital advertising dollars are going to Facebook and Google. ... But, as a consequence of their companies' role in disseminating fake news, there is a growing realization – among the public, the business community and politicians – that the fate of these 'tech companies' is tied in many ways to the sustainability of news organizations in thousands of communities around the country" (p.49). To respond to the undermining of journalism, the Australian government has introduced a controversial law requiring social media companies to pay for the online news content they make available to users. In response Facebook threatened a news "boycott." "Facebook Australia managing director Will Easton told local users on Tuesday that it was prepared to block news from being shared on its main app and Instagram in Australia to avoid being penalised by a world-first piece of legislation being created to make the tech giant pay for the use of news content." *'We don't respond to coercion': Frydenberg rejects Facebook news boycott threat*, Sydney Morning Herald, By Zoe Samios and David Crowe, September 1, 2020. Similarly, Google has threatened to shut down search in Australia if the digital news code goes ahead. Earlier Google had sought "to evade paying French publishers for reuse of snippets of content," but the national competition watchdog (FCA) quashed the attempt, forcing Google to reach an agreement with "an association of French publishers over how it will be pay for reuse of snippets of their content" ↩

41. See Fair Tax Mark's report *Tax gap of Silicon Six over $100 billion so far this decade*, December 2019. ↩
42. The Global Antitrust Institute at George Mason University, as one example, is bankrolled in large part by tech companies that are facing antitrust scrutiny from some of the same regulators who attend its programs. See Daisuke Wakabayashi (2020) *Big Tech Funds a Think Tank Pushing for Fewer Rules. For Big Tech*. ↩
43. The widespread shifts from ownership to service models in music streaming, ebook access, and cloud computing extends beyond online media. In a striking example, John Deere, General Motors and other manufacturers told US legislators in 2015 that their tractor sales do not constitute a change of ownership but merely a usage license (Legal Comment, *We Can't Let John Deere Destroy the Very Idea of Ownership* 2015). Three years later, Wired wrote that the "California Farm Bureau gave up the right to purchase repair parts without going through a dealer. Farmers can't change engine settings, can't retrofit old equipment with new features, and can't modify their tractors to meet new environmental standards on their own. Worse, the lobbyists are calling it a victory." Organizations like The Repair Association and the EFF are fighting to establish legislation to guarantee the right to repair for consumers. ↩
44. Among the many problematic Big Tech acquisitions are Facebook's purchase of competing social media services, Instagram ($1B) and WhatsApp ($19B), and Amazon's purchase of Whole Foods ($13.7B) and Zappos ($1.2B) For a list of hundreds of mergers and acquisitions that Google, Apple, Amazon and Facebook have used to gain market power, acquire data, and eliminate threats from would-be competitors, see American Economic Liberties' Merger Tracker. While not included in this list, Microsoft has made the most acquisitions of the Big Five. See also Matt Stoller, Sarah Miller, and Zephyr Teachout, *Addressing Facebook and Google's Harms Through a Regulated Competition Approach* (Washington: American Economic Liberties Project, 2020). ↩
45. See Elizabeth Warren (2019) *Here's how we can break up Big Tech*, *Medium*, Mar 8. ↩
46. See for example, Joshua Gans (2018) *It's Time for Identity Portability*, June 13 2018. ↩
47.

Extended Producer Responsibility (EPR) is a regulatory approach to holding producers more directly responsible for the environmental effects of their activity (see OECD, wikipedia).

This might include introducing legislation that requires Big Tech companies and organizations to become carbon neutral. At the moment, increasing efficiency and reductions of waste impact per electronic device is more than offset by the continued fast replacement cycles of electronic devices and the rapid growth of data centers. As a result, e-waste continues to rise globally, as does the

carbon impact of ICT. Most of the burden is carried by people in the Global South. See Widmer, Rolf, Heidi Oswald-Krapf, Deepali Sinha-Khetriwal, Max Schnellmann, and Heinz Böni. 2005. *'Global Perspectives on E-Waste'*. Environmental Impact Assessment Review, Environmental and Social Impacts of Electronic Waste Recycling, 25 (5): 436–58; Grant, Kristen, Fiona C Goldizen, Peter D Sly, Marie-Noel Brune, Maria Neira, Martin van den Berg, and Rosana E Norman. 2013. *'Health Consequences of Exposure to E-Waste: A Systematic Review'*. The Lancet Global Health 1 (6): e350–61. ↩

48. For example, see Elizabeth Warren's proposed, *Real Corporate Profits Tax* for a new tax system that would levy a 7 percent tax for every dollar of profit above $100 million. ↩

49. While state security surveillance programs that depend on access to Big Tech platforms, such as PRISM and others of the Five Eyes alliance exposed by Edward Snowden, are arguably illegal and/or unconstitutional, there are circumstances where they may be legitimate. A coalition of hundreds of NGOs internationally led by the Electronic Frontier Foundation developed a governance framework based on the *Universal Declaration of Human Rights* to address the complex trade offs involved. See: *Necessary and Proportionate Principles On the Application of Human Rights to Communications Surveillance.* ↩

50. Recent steps to strengthen privacy protection include the EU's General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA), which took effect in January 2020. See: Dimitri Sirota, *California's new data privacy law brings U.S. closer to GDPR*, *Tech Crunch*, November 14, 2019. (Accessed September 4, 2020) ↩

51.
In cloud services, this dependence is most notable in the case of Google (Google Cloud Services), Microsoft (Azure) and Amazon (Amazon Web Services). In the education sector, Microsoft and Google have largely driven out alternatives to their cloud services by offering their office tools and e-communications 'solutions' at no cost to educational institutions at every level from primary schools to universities. Once they've sewn up the market, will these services remain free, or will vendor lock-in rule the day? See: *Seeing through the cloud*.

Among the levers at governments' disposal for reducing this dependence is their considerable procurement power, in spending and standards adoption (e.g. open source, interoperability). Governments can also convene public/non-profit consortia to develop alternative approaches to developing and provisioning core digital infrastructure. Examples can be found in scientific and educational infrastructures such as the Ontario Council of Library's sizable Cloud services or the Hathitrust Digital Library. Recent clashes between Facebook and NYU over Facebook-critical research at NYU, and the unilateral decision by Zoom to shutdown a Zoom webinar about Zoom's

censorship of an even at SFSU, make it plainly visible that educational institutions must build their own core infrastructural alternatives free of Big Tech's censorship and influence. ↩

52. As an example see India's initiative to actively support tech startups: https://inc42.com/features/india-govt-backed-startup-incubation-centres/ ↩

53. See the Jan 4, 2021 announcement of the Alphabet Workers Union - Hundreds of Google Employees Unionize, Culminating Years of Activism and We're Google Workers. And We're Forming a Union. ↩

54.

For recent examples of tech worker resistance see the Tech Workers Coalition and the Collective Action In Tech website, which lists over 300 collective actions, many involving Big Tech companies. One issue in particular that has animated significant worker opposition across the tech industry is its collaboration with the US Immigration and Customs Enforcement (ICE) agency in pursuing the anti-immigrant policies of the Trump Administration. No Tech for ICE opposes tech companies providing the infrastructures, such as facial recognition, that ICE agents use to find targets, conduct raids, and make arrests, and calls on Silicon Valley to stop working for ICE immediately. As Meredith Whittaker, former Google researcher and Co-Founder and Co-Director of NYU's AI Now Institute, notes:

> "I think the No Tech for ICE movement is one example where you saw tech workers across the industry taking the lead of people who do immigration policy, immigration advocacy on the U.S. southern border, and really understanding the context of what it means to be hunted and tracked by this technology, communicating that to the people who don't have that experience but may have an understanding of how these systems work to build a campaign that is then pushing back against the companies who are provisioning those types of systems to ICE."
>
> Kantrowitz (2020) Ex-Googler Meredith Whittaker on Political Power in Tech

A related example is Hootsuite employees organizing successfully to protest the signing of a contract with ICE: the company pulled out, while maintaining its B Corp certification, reflecting the "highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose." ↩

55. Note the effective resistance to Palantir sponsorship of the Grace Hopper Celebration, the world's largest conference for women in computing, and the Berkeley Law School Privacy Conference, also reported here. ↩

56. Relevant bodies include the ACM (Association for Computing Machinery), IEEE Computer Society, CRA (Computing Research Association), and IET (Institution of Engineering and Technology). ↩

57. The Erasmus+ project VASE for example aims to develop teaching materials to educate technology students about values, ethics and responsibility. ↩

58. Associations of scientists, writers, and journalists often engage in campaigns to ensure the rights of their colleagues around the world who challenge the powers that be. And organizations such as the Association for Progressive Communications (APC) have been working internationally since the 1980s to help empower activists, social movements, and excluded communities and to challenge the hold that Big Tech and authoritarian governments have over communication systems. ↩

59. In *Coding Democracy: How Hackers Are Disrupting Power, Surveillance, and Authoritarianism,* Maureen Webb (2020) provides valuable insights into the ways progressive hackers are working toward democracy through their "critical technological practices" (Agre, 1997). ↩

60. Civil society organizations (CSOs) are "Non-State, not-for-profit, voluntary entities formed by people in the social sphere that are separate from the State and the market." While sharing many core characteristics with non-governmental organizations (NGOs) and not-for-profit organizations (NPOs), CSO infers a broader scope reflecting Civil Society more generally. ↩

61. See for example, American Economic Liberties' Big Tech Monopolies project with its Abuse Tracker and Merger Tracker and Schuler, D. (1996). *New community networks: Wired for change*. An example of such a community network is accountabletech.org, which fights to hold tech companies accountable through innovative approaches that call out their spread of misinformation and demand action to restore the integrity of their platforms and our democracy. ↩

62. A notable alternative to Big Tech and commercial platforms is Riseup.net, which provides online communication tools in 11 languages "for people and groups working on liberatory social change." These tools include email, chat, VPN, mailing lists and group collaboration services such as private wikis, real-time collaborative text editor and file sharing. Another example is VozMob, a mobile blogging platform developed through participatory design, to help project the voices of immigrant workers by appropriating mobile phones for popular communication. Potential users often face a difficult dilemma since these services have difficulty competing with their relatively better resourced commercial alternatives in terms of features and reliability. Better funding for CSO platforms by redirecting revenue streams, as we call for in this defunding initiative, would go a long way to foster viable pro-social alternatives. ↩

63. IT for Change, an NGO based in Bengaluru, India, seeks to combat corporatization of the social sphere and the displacement of "democratic participation, commons, social justice and gender

equality from development discourse" and use digital technologies to contribute to human rights, social justice and equity. ↩

64. As noted in Why Markets Boomed in a Year of Human Misery, "Essentially, the rise in savings among the people who have avoided major economic damage from the pandemic is creating a tide lifting the values of nearly all financial assets." Those whose savings have soared during the Covid outbreak have contributed significantly to the more than doubling of Big Tech's stock prices during 2020 (see Appendix). Investing more directly in information and communication infrastructures that strengthen democratic society may prove a better long term investment, individually and collectively. ↩

65. The story of Max Schrems, a young Austrian lawyer and privacy advocate, who launched multiple legal challenges against Facebook as well as the Irish Data Protection Commissioner provides an inspiring example of how a determined and talented individual can successfully take on both governments and tech giants, and win. While still a student, Schrems launched the Europe v. Facebook campaign which challenged the international agreements that enabled Facebook and more than 5,000 other U.S. corporations to transfer the personal data of Europeans to the US. In its 'Schrems I' and 'Schrems II' rulings the Court of Justice of the European Union (CJEU) struck down these agreements on the grounds of inadequate protection against NSA surveillance, notably the PRISM program mentioned earlier. Schrems founded and now leads the NYOB European Centre for Digital Rights, which helps people use the GDPR to assert their rights against tech companies. ↩

66. Adopting these alternate services has the dual benefit of challenging Big Tech's surveillance based business model while enhancing privacy and security. e.g. browsing: Mozilla Firefox, Tor; searching: DuckDuckGo; emailing: ProtonMail, Riseup mail, Pretty Good Privacy (PGP); messaging: Signal, Off-the-Record (OTR); video conferencing: JITSI; ad blocking: uBlock Origin, Disconnect; tracker monitoring: Lightbeam for Firefox; mapping: OpenStreetMap. See also these resources: Electronic Frontier Foundation's Surveillance Self-Defense project, Freedom of the Press Foundation guides and ACLU anti-surveillance resources. ↩

67. While there have been several calls over recent years for Facebook users to boycott the platform, it isn't surprising that these have had little effect. So many people have come to rely on FB for maintaining their social networks that it has now become an essential information and communication infrastructure. The lack of a viable option to move to an alternative service while keeping one's social connections means that ceasing to use FB incurs a heavy personal price. It appears that advertiser boycotts are more effective than individuals boycotting Facebook itself. For example, as a result of the 2017 boycotts by major brands such as Verizon, Walmart, and Pepsi against YouTube's contents promoting extremist or racist views, YouTube changed its policies and invested heavily in tools to give advertisers more control. More recently, reacting to popular protests

under the Black Lives Matter banner, over 750 companies temporarily paused their advertising on Facebook and its subsidiary Instagram, calling on the company to better regulate hate speech and political mis-information on its platform. Facebook has reluctantly begun to respond by changing its moderation policies. ↩

68. For example, see the coalition of hundreds of NGOs internationally behind the Necessary and Proportionate Principles On the Application of Human Rights to Communications Surveillance. ↩

69. In a New York Times Opinion piece, The Coup We Are Not Talking About, Shoshana Zuboff (2021 Jan 29) argues that anti-trust measures modeled on the Sherman Act of the 19th century alone do not address the real harms of the surveillance capitalism and their causes. "There may be sound antitrust reasons to break up the big tech empires, [but carving them up] would not shield us from the clear and present dangers of surveillance capitalism." In particular she calls for ending the data collection operations of commercial surveillance, enacting laws that tie data collection to fundamental rights and data use to public service, and disrupting the financial incentives that reward surveillance economics. ↩

70. We take a broad view of what constitutes community tech, based on the core concept of serving community information and communications through technological development under community control. It traces its roots to various community media initiatives from the early 20th century, starting with community radio, then community TV and in the 1970s computer-based community networking experiments (e.g. the Community Memory Project based in Berkeley). It's closest academic affiliation is with the interdisciplinary field of Community Informatics. See the Journal of Community Informatics (JoCI) and Clement *et al* (2012). Schuler (1996) articulates six core values of community: Conviviality and Culture, Education, Governance, Health, Economics, and Information and Communication. ↩

71. Rather than claiming all the resources that may be diverted away from Big Tech, our proposals are intended to complement and reinforce other non-technologically focussed beneficiary initiatives aimed at re-dressing Big Tech's harms on society and the environment, as well as promoting well-being more generally. ↩

72. See CPSR's "One Planet, One Net" campaign and more recent initiatives such as the Association for Progressive Communication (APC) sponsored Feminist Principles of the Internet which has identified "17 Principles total, organized in 5 clusters: Access, Movements, Economy, Expression, and Embodiment. Together, they aim to provide a framework for women's movements to articulate and explore issues related to technology." The Principles are accompanied by living examples of projects working for their realization. ↩

73. For example, universal access to a 'basket' of basic services that are widely useful, reliable, secure, affordable and protective of human rights (see Section 7 of the Canadian Telecommunications Act, among others). ↩

74. Both personal computing and social media first emerged as non-profit, community initiatives in the Bay Area, before "Silicon Valley" came into widespread usage. See notably the Homebrew Computer Club, founded in 1975, and the Community Memory project founded in 1973. Schuler, D. *op. Cit.* provides a rich survey of the types of projects that were spawned before the advent of the web. ↩

75. Including Russia, Ukraine, Japan, Ecuador, Germany, Italy, and Iceland as well as the United States and Canada. See Schuler, D. (1996). ↩

76. Going further, some of these engaged in community tech for the protection of their communities. One example of this is the Los Angeles Community Action Network (LACAN), a grassroots group made up of homeless and low-income Skid Row residents, which during the 1990s generated video evidence for use in lawsuits against the Los Angeles Police Department (LAPD). ↩

77. Leading examples of widely used, non-profit, community tech organizations/services include Wikipedia, Mozilla (Firefox), OpenStreetMap. ↩

78. 'Public goods' is not adequate since the standard neoclassical economic definition does not fully capture the core idea of widespread positive externalities. 'Common good' does better, but is not as familiar. See https://en.wikipedia.org/wiki/Public_good. It should be noted that the lack of a functioning revenue model is not necessarily a failure of the organization, but a failure of the market. And public institutions and community initiatives can be significantly more efficient than market dependent organizations, achieving significantly higher returns on investment (ROI). e.g. A management study of the Toronto Public Library (TPL), the largest library system in the world, reported that for every dollar invested in the TPL, Torontonians receive $5.63 of value. The value of membership for library users, which is free for residents, can be as much as $500. ↩

79. Where communities do not have access to good affordable internet service, some have developed their own community based ISPs, e.g. Waves project in Baltimore. See Journal of Community Informatics (JoCI) for research reports on a wide range of community networking initiatives internationally. As a way to avoid possible problems of platform ownership (e.g., capitalist profitability and worker exploitation), Costanza-Chock (2017) proposed organic self-organization, platform organizing by labor unions, and platform cooperativism, e.g., Turkopticon, SherpaShare, Contratados.org, Care.com's (Design Justice Zine Issue #3, "Design Justice for Action.) See also Costanza-Chock (2020). ↩

80. See Gastil and Davies (2020). ↩

81. For a good survey of smart city initiatives globally, highlighting alternative governance approaches, see Mosco (2019). Google's failed smart city initiative in Toronto through its 'urban innovation' subsidiary Sidewalk Labs, offers a cautionary tale of what can happen when a Big Tech company thrusts an overly techno-centric vision onto a city whose residents have other ideas about how they'd like their city developed. See: Wylie (2020), Saxe and Siemiatycki (2019), Valverde and Flynn (2020) ↩

82. https://decidim.org ↩

83. See for example the recent consultative activity by the International Red Cross Red Crescent (RCRC): RCRC Digital Consultation: Data Protection & Data Responsibility ↩

84. See for example: Ushahidi, a social enterprise that provides software and services to numerous sectors and civil society to help improve the bottom up flow of information, Diaspora, a social media platform where you own your own data; Bookshop.org, "an online bookstore with a mission to financially support local, independent bookstores;" and IndieWeb, "a people-focused alternative to the 'corporate web.'" ↩

85. For example, Hardjono and Pentland (2019) discuss member-focused data cooperatives, which include such features as individual control over data by members, fiduciary obligations to members and direct benefits to members. This model also proposes a solution for how to operate algorithms by moving the algorithms to the data cooperative and not the other way around. This way, cooperatives can vet, control and ensure that their data is secure, used under its own terms, and compatible across multiple services. Another collective information model is offered by the First Nations Information Governance Centre, which has developed principles of OCAP (Ownership, Control, Access and Possession) designed to enable First Nations to own and control how their data is collected, accessed and/or used. See also the Canadian Internet Policy and Public Interest Clinic (CIPPIC) report (2020) The Price of Trust? An Analysis of Emerging Digital Stewardship Models ↩

86. Sentilo is "an open source sensor and actuator platform designed to fit in the Smart City architecture of any city who looks for openness and easy interoperability." See also the Europe wide DECODE project, which is developing tools that put individuals in control of whether they keep their personal data private or share it for the public good. DECODE has been piloted in Amsterdam and Barcelona, between 2017 and 2019. ↩

87. Telecomunicaciones Indígenas Comunitarias "is a civil association made up of indigenous and rural communities in Mexico and an operational team that supports individuals and communities seeking to build, manage and operate their own communication networks." ↩

88. See for example Free Geek, whose "mission is to sustainably reuse technology, enable digital access, and provide education to create a community that empowers people to realize their potential" and ReBOOT Canada, whose "programs connect communities, teach skills and bring the benefits of technology to all Canadians." ↩

89. See Fishkin (2018) and others on citizen assemblies, and the People's Voice on Climate ↩

90. A citizen's assembly has recently been proposed to tackle another thorny problem — that of genome editing— but on a global scale. See Dryzek (2020). ↩