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Many Tech Experts Say Digital Disruption Will Hurt Democracy

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Experts Say Digital Disruption Will Hurt Democracy

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The years of almost unfettered enthusiasm about the benefits of the internet have been followed by a period of techlash as users worry about the actors who exploit the speed, reach and complexity of the internet for harmful purposes. Over the past four years – a time of the Brexit decision in the United Kingdom, the American presidential election and a variety of other elections – the digital disruption of democracy has been a leading concern.

The hunt for remedies is at an early stage. Resistance to American-based big tech firms is increasingly evident, and some tech pioneers have joined the chorus. Governments are actively investigating technology firms, and some tech firms themselves are requesting government regulation. Additionally, nonprofit organizations and foundations are directing resources toward finding the best strategies for coping with the harmful effects of disruption. For example, the Knight Foundation announced in 2019 that it is awarding $50 million in grants to encourage the development of a new field of research centered on technology's impact on democracy.

In light of this furor, Pew Research Center and Elon University's Imagining the Internet Center canvassed technology experts in the summer of 2019 to gain their insights about potential future effects upon democracy of people's uses of technology. Overall, 979 technology innovators, developers, business and policy leaders, researchers and activists responded to the following query:

> ***Technology's impact on democratic institutions/representation:*** *Between now and 2030, how will use of technology by citizens, civil society groups and governments affect core aspects of democracy and democratic representation? Will they mostly weaken core aspects of democracy and democratic representation, mostly strengthen core aspects of democracy and democratic representation or not much change in core aspects of democracy and democratic representation?*

Some **49%** of these respondents say use of technology will *mostly weaken core aspects of democracy and democratic representation in the next decade,* **33%** say use of technology will

mostly strengthen core aspects of democracy and democratic representation and **18%** say there will be *no significant change* in the next decade.

This is a nonscientific canvassing based on a non-random sample. The results represent the opinions of the individuals who responded to the query and are not projectable to any other population. The methodology underlying this canvassing is elaborated at the end of this report in a section titled "About The Canvassing." The bulk of this report covers these experts' written answers explaining their responses.

In addition to the plurality view among these experts that democracy will be weakened, a large majority of the entire set of respondents – including both the pessimists and the optimists – voiced concerns they believe should be addressed to keep democracy vibrant. Their worries often center on the interplay of trust, truth and democracy, a cluster of subjects that have framed key research by Pew in recent months. The logic in some expert answers goes this way: The misuse of digital technology to manipulate and weaponize facts affects people's trust in institutions and each other. That ebbing of trust affects people's views about whether democratic processes and institutions designed to empower citizens are working.

Some think the information and trust environment will worsen by 2030 thanks to the rise of video deepfakes, cheapfakes and other misinformation tactics. They fear that this downward spiral toward disbelief and despair also is tied to the protracted struggles facing truthful, independent journalism. Moreover, many of these experts say they worry about the future of democracy because of the power of major technology companies and their role in democratic discourse, as well as the way those companies exploit the data they collect about users.

In explaining why he feels technology use will mostly weaken core aspects of democracy and democratic representation, **Jonathan Morgan,** senior design researcher with the Wikimedia Foundation, described the problem this way: "I'm primarily concerned with three things. 1) The use of social media by interested groups to spread disinformation in a strategic, coordinated fashion with the intent of undermining people's trust in institutions and/or convincing them to believe things that aren't true. 2) The role of proprietary, closed platforms run by profit-driven companies in disseminating information to citizens, collecting information from (and about) citizens, and engaging political stakeholder groups. These platforms were not designed to be 'digital commons,' are not equally accessible to everyone and are not run for the sake of promoting social welfare or broad-based civic participation. These companies' profit motives, business models, data-gathering practices, process/procedural opacity and power (and therefore, resilience against regulation undertaken for prosocial purposes) make them poorly suited to promoting democracy. 3) The growing role of surveillance by digital platform owners (and other economic

actors that collect and transact digital trace data) as well as by state actors, and the increasing power of machine learning-powered surveillance technologies for capturing and analyzing data, threaten the public's ability to engage safely and equitably in civic discussions."

Those who are more optimistic expect that effective solutions to these problems will evolve because people always adapt and can use technology to combat the problems that face democracy. Those who do not expect much change generally say they believe that humans' uses of technology will continue to remain a fairly stable mix of both positive and negative outcomes for society.

The main themes found in an analysis of the experts' comments are outlined in the following two-page, two-part table.

Themes About the Digital Disruption of Democracy in the Next Decade

Concerns for Democracy's Future

Power Imbalance: Democracy is at risk because those with power will seek to maintain it by building systems that serve them not the masses. Too few in the general public possess enough knowledge to resist this assertion of power

EMPOWERING THE POWERFUL	Corporate and government agendas generally do not serve democratic goals and outcomes. They serve the goals of those in power.
DIMINISHING THE GOVERNED	Digitally-networked surveillance capitalism creates an undemocratic class system pitting the controllers against the controlled.
EXPLOITING DIGITAL ILLITERACY	A lack of digital fluency and a high level of apathy among the public produces an ill-informed and/or dispassionate citizenry, weakening democracy and the fabric of society.
WAGING INFO-WARS	Technology will be weaponized to target vulnerable populations and engineer elections.

Trust issues: The rise of misinformation and disinformation erodes public trust in many institutions

SOWING CONFUSION	Tech-borne reality distortion is crushing the already-shaky public trust in the institutions of democracy.
WEAKENING JOURNALISM	There seems to be no solution for problems caused by the rise of social media-abetted tribalism and the decline of trusted, independent journalism.
RESPONDING TOO SLOWLY	The speed, scope and impact of the technologies of manipulation may be difficult to overcome as the pace of change accelerates.

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Themes About the Digital Disruption of Democracy in the Next Decade

Hopes and Suggested Solutions

Innovation is inevitable: Change is beginning to happen at the level of individuals and social systems. History shows how human adaption pays off in the long run.

EVOLVING INDIVIDUALS — Increased citizen awareness, digital literacy improvements and better engagement among educators will be evident in the next decade.

ADAPTING SYSTEMS — Changes in the design of human systems and an improved ethos among technologists will help democracy.

ENSHRINING VALUES — Deep-rooted human behaviors have always created challenges to democratic ideals. Historically, though, inspired people have shown they can overcome these darker tendencies.

Leadership and activist agitation will create change

WORKING FOR GOOD — Governments, enlightened leaders and activists will help steer policy and democratic processes to produce better democratic outcomes.

Technology will be part of the solution: Some of the tech tools now undermining democracy will come to its aid and helpful innovations will be created.

ASSISTING REFORMS — Pro-democracy governance solutions will be aided by the spread of technology and innovations like artificial intelligence. Those will work in favor of trusted free speech and greater citizen empowerment.

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Some of the most striking observations about democracy's current predicament came in the following experts' responses:

danah boyd, principal researcher at Microsoft Research and founder of Data & Society, wrote, "Democracy requires the public to come together and work through differences in order to self-govern. That is a hard task in the best of times, but when the public is anxious, fearful, confused or otherwise insecure, they are more likely to retreat from the collective and focus on self-interest. Technology is destabilizing. That can help trigger positive change, but it can also trigger tremendous anxiety. Technology also reconfigures power, at least temporarily. This can benefit social movements, but it can also benefit adversarial actors. All too often, technology is designed naively, imagining all of the good but not building safeguards to prevent the bad. The problem is

that technology mirrors and magnifies the good, bad AND ugly in everyday life. And right now, we do not have the safeguards, security or policies in place to prevent manipulators from doing significant harm with the technologies designed to connect people and help spread information."

Susan Etlinger, an industry analyst with the Altimeter Group, responded, "Today we have the ability to amass massive amounts of data, create new types of data, weaponize it and create and move markets without governance structures sufficient to protect consumers, patients, residents, investors, customers and others – not to mention governments – from harm. If we intend to protect democracy, we need to move deliberately, but we also need to move fast. Reversing the damage of the 'fake news' era was hard enough before synthetic content; it will become exponentially harder as deepfake news becomes the norm. I'm less worried about sentient robots than I am about distorting reality and violating the human rights of real people at massive scale. It is therefore incumbent on both public and private institutions to put appropriate regulations in place and on citizens to become conscious consumers of digital information, wherever and however we find it."

Marc Rotenberg, executive director of the Electronic Privacy Information Center, said, "It was naive to believe that technology would strengthen democratic institutions. This became obvious as the technology companies almost immediately sought to exempt themselves from the laws and democratic rules that governed other businesses in such areas as political advertising, privacy protection, product liability and transparency. The rhetoric of 'multi-stakeholder processes' replaced the requirement of democratic decision-making. The impact was immediate and far-reaching: The rapid accumulation of power and wealth. Techniques that isolated and silenced political opponents, diminished collective action and placed key employees by the side of political leaders, including the president. And all with the support of a weakened political system that was mesmerized by the technology even as it failed to grasp the rapid changes underway."

An internet pioneer based in North America, said, "I am deeply concerned that democracy is under siege through abuse of online services and some seriously gullible citizens who have trouble distinguishing fact from fiction or who are wrapped up in conspiracy theories or who are unable or unwilling to exercise critical thinking. … We are seeing erosion of trust in our institutions, fed in part by disinformation and misinformation campaigns designed to achieve that objective and to stir dissent. We are seeing social networking systems that provoke feedback loops that lead to extremism. Metrics such as 'likes' or 'views' or 'followers' are maximized through expression of extreme content. Trolls use media that invite commentary to pump poison into discussion. Constant cyberattacks expose personal information or enable theft of intellectual property. Tools to facilitate cyberattacks are widely available and used to create botnets, generate denial of service attacks, spread malware, conduct ransom demands and a host of other harmful

things. Law enforcement is challenged in part by the transnational nature of the internet/web and lack of effective cooperative law enforcement agreements across national boundaries. Privacy is abused to commit crimes or other harmful acts. At the same time, privacy is extremely hard to come by given the ease with which information can be spread and found on the net. Nation-states and organized crime are actively exploiting weaknesses in online environments. Ironically, enormous amounts of useful information are found and used to good effect all the time, in spite of the ills listed above. The challenge we face is to find ways to preserve all the useful aspects of the internet while protecting against its abuse. If we fail, the internet will potentially devolve into a fragmented system offering only a fraction of its promise. In the meantime, democracy suffers."

Still, there are those who wrote that they expect human systems and tools will evolve to solve some of the new challenges to democracy.

Paul Saffo, chair for futures studies and forecasting at Singularity University and visiting scholar at Stanford MediaX, said, "There is a long history of new media forms creating initial chaos upon introduction and then being assimilated into society as a positive force. This is precisely what happened with print in the early 1500s and with newspapers over a century ago. New technologies are like wild animals – it takes time for cultures to tame them. I am not in any way downplaying the turbulence still ahead (the next five to seven years will not be fun), but there is a sunnier digital upland on the other side of the current chaos."

Brad Templeton, internet pioneer, futurist and activist, a former president of the Electronic Frontier Foundation, wrote, "There are going to be many threats to the democratic process that come through our new media. There are going to be countermeasures to those threats and there are going to be things that improve the process. It is very difficult for anybody to evaluate how the balance of these things will play out without knowing what the new threats and benefits will be, most of which are yet to be invented. It is certainly true that past analysis underestimated the threats. Hopefully this at least will not happen as much."

One of the most extensive and thoughtful answers to the canvassing question came from **Judith Donath**, a fellow at Harvard's Berkman Klein Center currently writing a book about technology, trust and deception and the founder of the Sociable Media Group at the MIT Media Lab. She chose not to select any of the three possible choices offered in this canvassing, instead sharing two possible scenarios for 2030 and beyond. In one scenario, she said, "democracy is in tatters." Disasters created or abetted by technology spark the "ancient response" – the public's fear-driven turn toward authoritarianism.

In the second scenario, "Post-capitalist democracy prevails. Fairness and equal opportunity are recognized to benefit all. The wealth from automation is shared among the whole population. Investments in education foster critical thinking and artistic, scientific and technological creativity. … New voting methods increasingly feature direct democracy – AI translates voter preferences into policy."

Donath's full mini-essay can be read at the end of this report.

The 12 main themes emerging from these experts' comments are shared in the following section, along with a few representative expert responses for each.

1. Themes about the digital disruption of democracy in the next decade

The pessimists about democracy in this canvassing make several arguments and foresee several outcomes. A share believe that there will be not be adequate reform in the design and management of technology platforms; that government will not respond in the best interests of citizens; that the speed, scope and impact of digital tools all work in favor of bad actors; and that educational processes and growing citizen awareness of the flaws now emerging in tech systems will not significantly lessen the known harms that networked digital technologies can enable in the next decade.

This section includes elaboration on each of the most common themes. Some responses have been lightly edited for clarity.

Concerns for democracy's future

Two main themes emerge in the answers of those who are mostly worried about the impact of technology on democracy. The first ties to their view that democracy is at risk because those with power seek to maintain their power by building systems that serve them, not the masses. These respondents say that elites' control over technology systems gives them new tools and tactics to enhance their power, including by weaponizing technology. The growing imbalance further erodes individuals' belief in their agency and impact as actors in their democracy. The resulting fatalism causes some to give up on democracy, ceding more control to the elites.

The second broad concern links to issues around trust. These experts worry that the rise of misinformation and disinformation erodes public trust in many institutions and one another, lowering incentives to reform and rebuild those institutions.

Theme 1: Empowering the powerful: Corporate and government agendas generally do not serve democratic goals and outcomes. They serve the goals of those in power.

Responses representing this theme:

Srinivasan Ramani, Internet Hall of Fame member and pioneer of the internet in India, wrote, "Unless society regulates democratic processes to avoid exploitation, we have to assume that those who can get away with it, will in fact get away with it. There is a very strong incentive for politicians to use technology to win elections. This is not matched by the zeal of the citizens'

representatives to use technology to learn about peoples' problems and to deal with them. There is no movement to use technology to improve democracy. Improving transparency in governance, improving citizen awareness of societal issues and choices, and similar steps forward are essential. We did not let loose the monster of electricity on our people without regulations and safeguards. In comparison, we seem to be letting loose the privacy-eating monsters of technology on internet and telecom users."

Neal Gorenflo, cofounder, chief editor and executive director at Shareable, an award-winning nonprofit news outlet, said, "The crisis is now. Currently, just a few big corporations control our digital lives, and users have no say. If this monopolist regime and the gaping power asymmetry between platforms and users continues, we'll see a continued decline of democratic institutions. In addition, tech culture is becoming popular culture. Tech culture prizes speed, scale, efficiency, convenience, a disregard for the law (move fast and break things; ask forgiveness not permission) and a dislike, if not hatred, of government – the perfect ingredients for fascism. Tech monopolies and culture are profoundly shaping our lives and perceptions, and this is done for profit at the expense of our ability to understand the world, relate to one another constructively, feel valued and have some control over our circumstances. If not corrected, this will lead to a collapse in our ability to rule ourselves effectively, and perhaps well before 2030."

Joseph Turow, professor of communication, University of Pennsylvania, commented, "I fear that a combination of political-marketing interests and antidemocratic forces within the U.S. and outside will create an environment of concocted stories (often reflecting conspiracy theories) targeted in hyper-personalized ways. The situation will make it virtually impossible for the press and civic groups to track and/or challenge lies or highlight accurate claims effectively to the electorate because there will be so many mass-customized variants, and because news audiences will be so fragmented. At the same time, people running for election will convince a significant percentage of the population to refuse to deal with or to confuse pollsters that don't represent their constituencies. These long-term dynamics will undermine our traditional sense of an open and democratic election – though politicians encouraging the dynamics will insist the system remains open and democratic. I fear regulations will not be able to mitigate these problems."

Anita Salem, research associate at the Graduate School of Business and Public Policy, Naval Postgraduate School, said, "As corporations gain more control and freedom, they are able to more effectively harness their resources to manipulate public perceptions. They have the resources to fully engage big data to leverage individual preferences and habits into structured sales and influence campaigns that can effectively manipulate opinions and behaviors of the common man. They will also use these resources to continue to purchase the votes of democratically elected officials. This will put corporations in control of the top decision-makers and the majority of the

voting public and result in a new-age oligarchy. Democracy will collapse and be replaced by the oligarchy that has been feeding the masses."

Theme 2: Diminishing the governed: Digitally networked surveillance capitalism creates an undemocratic class system that pits the controllers against the controlled.

Responses representing this theme:

Henning Schulzrinne, Internet Hall of Fame member and former chief technology officer for the Federal Communications Commission, wrote, "Unless changes are made, many citizens will increasingly see their role as diminished and inconsequential as the tools of democracy will no longer work and will have obviously failed – voting, protest, contacts with representatives, the media. Technology's effect will strongly depend on the participants in the political process. If political actors (parties, major civic organizations, individual leaders) want to make democracy work better, technology can help. If they want to mainly ensure that their party cannot lose elections, technology offers plenty of tools of disinformation, vote rigging and suppression, gerrymandering, untraceable donations and foreign influence. Unfortunately, right-wing parties seem to have taken a liking to the latter approach, particularly if they see their influence endangered by new majorities. Changes will depend on the country and the ability of its systems to adjust to two challenges: institutional and issues. The institutional challenge is how citizens can contribute meaningfully to political deliberations, without having the sense that their voices are ignored anyway or that electoral majorities are superseded by rule-based majorities, i.e., where gerrymandering, vote rigging and voter suppression determine the outcome. Secondly, a number of issues that have been largely procrastinated on require governmental action, primarily legislative, namely climate change, lack of social mobility, income stagnation and the impact of aging societies."

Christian Huitema, president at Private Octopus and longtime internet developer and administrator, said, "Large technology companies have adopted the 'surveillance capitalism' model. They collect large amounts of data about people, and then profit from the data in multiple ways. They also engage in 'attention-maximization' techniques, using the body of data to cleverly incite more and more consumption of their services, and of course more and more surrendering of personal data. Most technology markets evolve into a winner-take-all future. Surveillance capitalism is not an exception. More data implies more power over the user, and accrued advantage for further data collection. In my nightmares, this leads to a concentration of power in the hands of a few companies, where the 'data lords' of surveillance capitalism have as much respect for democracy as yesterday's feudal lords. I really hope that society will rebel against the

data lords, and somehow invalidate the attractiveness of data collection. But there are only a few chances of that happening."

Paul Lindner, a technologist who has worked for several leading innovative technology companies, wrote, "Technology subsumes citizen democracy by replacing informed choices with behavioral modification in the service of profits and capitalism. Without a major shift toward community-owned and -controlled platforms, society will become increasingly split into controllers and the controlled."

Theme 3: Exploiting digital illiteracy: A lack of digital fluency and a high level of apathy among the public produces an ill-informed and/or dispassionate citizenry, weakening democracy and the fabric of society.

Responses representing this theme:

Wendy Belluomini, a director and research scientist for IBM whose focus is artificial intelligence and cognitive software, said, "Platforms are easily manipulated by actors hostile to democracy as well as factions within a democracy. The electorate is not typically sophisticated enough to see this happening in real time."

Carol Chetkovich, professor emeritus of public policy at Mills College, said, "The dangers of social media/IT are aggravated by the degree to which large segments of the population seem to be lacking the skills needed for democracy (ability to listen, think critically, gather data, weigh sources and empathize), because when voters lack these capacities, they become extremely subject to manipulation. Manipulation in politics has always been a concern, but it seems as if the scale and sophistication of manipulation through social media has taken this threat to a new level. And we are not really working on the problem of ensuring a better equipped/educated electorate."

Leila Bighash, assistant professor of communication, University of Arizona, expert in online public information, news and social media, said, "By 2030 … the truth and falsity of claims made will constantly be questioned. Evidence will be faked or destroyed to support claims. People will wonder: How do we make democracy work if we can't even be sure of objective truth and facts? How can we hold our elected officials accountable if we can't get accurate or full information? Technology plays a role in this because, as we've already seen, there are sophisticated methods for creating and spreading disinformation and misinformation. Democratic elections, the fundamental essence of democracy, are already being threatened with technologically sophisticated operations by various actors."

A director for a leading global human rights organization said, "Without better technological literacy and better public awareness campaigns, technology has the potential to weaken democracy by reinforcing opinions people already hold and thus polarizing societies, creating a chaos of information that makes it harder to discern truth – especially if people gravitate toward self-reinforcing information. At a minimum, that could lead to greater voter apathy, polarization and a sense that any one vote does not matter. It may also push politicians to extreme positions."

Theme 4: Waging info-wars: Technology will be weaponized to target vulnerable populations and engineer elections.

Responses representing this theme:

Peter W. Singer, founding director of the Center for 21st Century Security and Intelligence at the Brookings Institution, wrote, "Information on the internet has increasingly been weaponized in ways that attack the fundamentals of the Enlightenment, most especially shared truth, which modern democracies are based upon."

Shel Israel, Forbes columnist and author of many business books on disruptive technologies, including "Resurrecting Trust: Technology, Transparency and the Bottom Line," said, "Hackers and cyber terrorists keep getting better, and no one seems to have a realistic remedy. I am a career optimist and tech enthusiast. Yet, in this dire situation, I don't see how tech will fix what tech has broken, and governments seem impotent in dealing with the issue."

Hume Winzar, associate professor and director of the business analytics undergraduate program at Macquarie University, Sydney, Australia, said, "Foreign interference will continue. Russia's sometimes embarrassingly simplistic social media posts actually gained more traction than they should have in the 2016 U.S. presidential election, and they're becoming more sophisticated."

Theme 5: Sowing confusion: Tech-borne reality distortion is crushing the already-shaky public trust in the institutions of democracy.

Responses representing this theme:

Mark Surman, executive director, Mozilla Foundation, and cofounder, Commons Group, wrote, "Well-resourced states and bad actors are increasingly using the internet to misinform people and put cracks in democracy. They are censoring and blocking alternative voices. These trends are

upending free speech and other democratic benefits the internet brought over the last few decades."

Jonathan Grudin, principal researcher for Microsoft, wrote, "Digital media overwhelm people with a sense of the complexity of the world and undermine trust in institutions, governments and leaders. Many people seize simplistic unworkable solutions offered by actual and wannabe tyrants. Add to this the ease of spreading false information and the difficulty of formulating effective regulations for a global system and it is difficult even to envision a positive outcome, much less take steps to realize it."

Daniel Berleant, author of "The Human Race to the Future," wrote, "While the web has the demonstrated ability to ease and enhance information flow to citizens, the quality of that information was never anticipated to be as shockingly disruptive to democratic processes as it is turning out to be. Instead of more-informed citizens, often people are less informed: manipulated by partisan propaganda increasingly custom-targeted to its unwitting recipients; trolled by sophisticated organizations sometimes as arms of foreign governments (pioneered by Russia – its successes will surely spark other countries to spend greatly on copying and refining its techniques); sucked in by fringe movements that appear onscreen as equal to the well-developed mainstream institutions that provide long-term stability to societies; force-fed more information consumed with less thought; and so on. We may hope societies can adapt and find ways, social and technological, to compensate, adapt and ultimately strengthen traditions of freedom. Achieving that is a challenge countered by those who, disrespecting society, seek for their own interests to destroy it."

An anonymous respondent, wrote, "Technology-enabled disinformation is corrosive to democratic processes and institutions. There is no way to put the genie back in the bottle – increasingly we may be unable to have shared understandings of the world. Civility in civic discourse and integrity are increasingly quaint notions. We're already at a point when even educated citizens in First World societies are unable to distinguish fact from fiction. We're already seeing fear of the 'other' stoked to the point where inhumane treatment of children is accepted in this country. Democracy only works if there is an informed citizenry. And, right now, we have a booming misinformation infestation eating away at citizenship and democratic institutions."

Theme 6: Weakening journalism: There seems to be no solution for problems caused by the rise of social media-abetted tribalism and the decline of trusted, independent journalism.

Responses representing this theme:

Michael Wollowski, associate professor of computer science and software engineering at Rose-Hulman Institute of Technology and expert in the Internet of Things, diagrammatic systems and artificial intelligence, wrote, "My concerns are centered around how hard it is for citizens to stay informed in an objective way. If citizens cannot form an unbiased opinion, then democracy is lost. Technology designed to misinform will outperform those technologies that are designed to inform. Most people are not willing to inform themselves, and even those who are will have a hard time doing so. It is my fond hope that unbiased news will make a comeback."

Bruce Bimber, professor of political science at the University of California-Santa Barbara, said, "For better and for worse, news businesses of the mass media era served vital functions for citizens through their near-monopoly on the flow of political information. News businesses edited and filtered information about public affairs, and for all its flaws, that process accommodated some of the public's cognitive limitations and biases in ways that made democratic public spheres generally tractable for citizens. It rarely worked really well, but it worked adequately. Digital media are breaking the filtering and editing processes, and this erodes the epistemic basis for democracy."

David Eaves, a public policy entrepreneur expert in information technology and government at Harvard's Kennedy School, said, "I see technology having three drivers: 1) Destroying the business model of the mainstream press and resurrecting the partisan press of the late 18th and early 19th century. 2) Social and online media, combined with polling and increasingly big data, tilting power away from representatives and toward the executive branch, which, with more relative resources, can 'know' more about constituents than their representatives and being able to connect directly with them. 3) Online tracking and facial-recognition software reducing privacy and thus increasing the long-term social, political and economic costs of dissenting or protesting. All of these could pose threats to our democratic institutions, but they are likely also manageable and could even be harnessed to improve representation."

An anonymous respondent said, "The internet has done nothing to provide users with any way to weigh and sift the different claims made by different voices, a role once performed by professional journalists. This role has been entirely abdicated by the big content providers, such as Facebook and YouTube. These platforms allow people to find the 'information' with which they are most comfortable and reinforces existing tendencies toward confirmation bias. Because technology now lets us customize the information we receive, there's no shared sense of the informational or news agenda the way there was when most people got their news from the three major broadcast networks and from national and local newspapers. Democracy will be harder to support when people don't have a shared body of information about public affairs to debate. And the evisceration of local newspapers and the concentration of ownership of local television stations means that local news, in particular, is going to be less available and less useful."

Theme 7: Responding too slowly: The speed, scope and impact of the technologies of manipulation may be difficult to overcome as the pace of change accelerates.

Responses representing this theme:

Christopher Savage, a policy entrepreneur, said, "Eventually – on a scale of decades – technology will enhance and strengthen democratic institutions and civic engagement. But our cultural and psychological tools for obtaining, evaluating and understanding information are still far, far behind where they need to be to handle the polluted fire hose of crap thrown at us every day. And, worse, detecting and resisting the combined effects of detailed, intimate, pervasive-surveillance-based profiles of everyone – which reveal *how* to manipulate us – and ever-more-convincing fake news (deepfakes of video, audio and verbal authorship) – deployed precisely *to* manipulate us – will require a degree of sophistication in the consumption and processing of information that most of us just do not have and do not know how to get. Those seeking power (that is, politicians and those who enable them) cannot be expected to resist the temptation of using these tools to get it. So, the processes of democracy are going to get worse before they get better."

Mike Gaudreau, a retired entrepreneur and business leader, wrote, "No matter how hard the legislators clamp down on social media, the nefarious will still find a way around the controls. Look at the number of data breaches we see today. I see this happening more and more. The ones out to corrupt our democracy will find ways to do so. China, for example, graduates millions of engineers and scientists yearly. Many will be deployed to hack systems so that they can steal information or plant messages that will unduly influence people."

Craig Watkins, a professor at the University of Texas – Austin, wrote, "The spread of these technologies around the world is happening faster than the knowledge and efforts to apply them in ways that support rather than weaken democracy. The spread of disinformation, deepfake videos and conspiracy theories requires a level of digital and civic literacy that, unfortunately, is underdeveloped around the world. This is true in even the most 'developed' countries like the U.S. and the UK. Democracy is under assault, and the deployment of technology is a key asset in the undermining of public discourse, civic engagement and voter participation. And while the pressure to assert greater regulatory authority over big tech is ramping up the pace of change – data rights, corporate responsibility and designing algorithms that address disparities and efforts to weaken democracy – it does not appear to be sufficient to contain the looming threats to a more democratic and inclusive civic sphere."

Mario Morino, chairman of the Morino Institute and cofounder of Venture Philanthropy Partners, a pioneer in venture philanthropy, said, "The hijacked use of technology innovation is

running far ahead of society's ability to absorb and comprehend the implications – good, bad and ugly – and it will get far worse before we ever see a turn for the better. The challenges are as diverse as the fueling of ideological and disruptive differences to the weakening of sovereign governments."

Hopes and suggested solutions

Any number of respondents started their answers with the notion that innovation for good is inevitable. They often cited history that is comforting on this front. Here are the themes they sounded that covered more hopeful thoughts and some of the ways progress might unfold.

Theme 1: Evolving individuals: Increased citizen awareness, digital literacy improvements and better engagement among educators will be evident in the next decade.

Responses representing this theme:

Beth Noveck, director of New York University's Governance Lab, wrote, "The public will be able to inform the agenda-setting process by sharing what they know about problems as they experience them. They will be able to do more than identify problems. They can contribute solutions to problems and deliberate with other citizens to craft and refine those solutions. They can and should be able to participate in drafting policies and proposals. Perhaps most important, they will be able to collectively hold government to account by tracking the effectiveness of the implementation of new policies and services. Finally, they will be able to exercise decision-making authority, voting on how money is spent and power wielded. With new technology, we can experiment with new ways of doing such things, too, including comparing the impact of having people volunteer to participate in such online processes versus selecting a sample of people to participate. There is much work to be done to test what will work to improve the impact of new technology on democracy in 2030."

Jason Kelley, a respondent who shared no background details, wrote, "Democracy may seem sick for a while. That's because we're living in a petri dish. But we're growing penicillin. The techlash we are experiencing is a valley in the sea change of positive impacts that technology has brought to our ability to organize, access accurate information and participate in our democratic institutions. Democratic institutions will become more beholden to citizens as the citizens become more capable of interacting with them and each other via technology. Also, citizens will become more interested in, and capable of, using technology to hold institutions accountable. It will likely be necessary for institutions to be more clear about their actions and processes to combat the spread of incorrect information and to adequately respond to citizens. It will certainly be necessary

for citizens to become better at disentangling the truth from the fiction. This is already happening. … It won't be a simple, quick, change; it will likely get worse before it gets better. The chances are good that our next election will be rife with these problems, and we're going to have to work hard to figure out solutions."

Doug Royer, a retired technology developer/administrator, responded, "Individuals are being empowered, for the first time in history, to easily describe their wishes, views, hopes and fears directly to and from politicians without distortion from news or information collectors. 1) Knowledge is the enemy of manipulation. 2) The ability to collect and search for facts increases knowledge. 3) I have noticed over time that debates between open individuals over the net also increase an observer's knowledge base. 4) The exceptions to No. 3 are being reduced by peer pressure to read up before commenting. Often the exceptions to No. 3 are isolating in and of themselves, and this is being noticed by their peers. And hopefully will be noticed by themselves and hopefully they will change or become less rigid in their reactions to others. 5) Technology, like never before, has allowed small pockets of intense beliefs and political stubbornness to be exposed. 6) Politicians, like never before in the history of mankind, are being held accountable for past actions. It is a pendulum of reaction that will swing a bit back and forth. The process will flail out the extreme left and right over time. 7) People are learning to tell what is and is not fake news. And the opposing news sites allow open individuals to search for the actual truth."

Theme 2: Adapting systems: Changes in the design of human systems and an improved ethos among technologists will help democracy.

Responses representing this theme:

Ben Shneiderman, distinguished professor of computer science and founder of Human Computer Interaction Lab, University of Maryland, commented, "Social media strengthens democratic institutions by giving a greater voice to a wider range of people, however, it also strengthens malicious actors such as political operators, criminals, terrorists and other socially disruptive forces. The goal of increased responsibility for actions will be helped by tech companies doing a better job of stopping bots, and improved ways to limit but not eliminate anonymity. Limiting malicious actors will require newly designed technology, social structures and government policies. New forms of independent oversight, regulatory strategies and community pressure will be helpful."

Henry Lieberman, research scientist, MIT Computer Science and Artificial Intelligence Lab (CSAIL), said, "The original design criteria for U.S. democracy still are great: government by the people; life, liberty and the pursuit of happiness. But the details and mechanisms of government were designed for the agricultural and industrial age, not today's digital age. By 2030, this will

become so obvious, and so appreciated especially by younger people, that we will have begun the debate about how to redesign our political and economic institutions."

Bryan Alexander, a futurist and consultant at the intersection of technology and learning, wrote, "There are numerous possibilities, and it's likely each will take hold in different places to varying degrees. Some will push to build transnational alliances to grapple with climate change and other issues, while others will encourage more local politics at the level of nation, region or city. Technology gives us more opportunities for direct democracy, possibly via rolling plebiscites. It also increases connections between officials and citizens through polling, sentiment analysis and surveillance. We should expect a role for artificial intelligence as political analyst and campaign assistant. The speed of political action should ramp up. So many things should remain, unless something extraordinary occurs: the practice of voting, most political boundaries, judicial review, constitutions."

Theme 3: Enshrining values: Deep-rooted human behaviors have always created challenges to democratic ideals. Historically, though, inspired people have shown they can overcome these darker tendencies.

Responses representing this theme:

Michael Pilos, chief marketing officer at FirePro, London, said, "These technological challenges will prove to be very fruitful for global democracy. Technology has consistently proven to expand and fine-tune democracy. Social media and other multimedia platforms have exponentially opened minds and flattened perceptions across the globe. Let's not miss out on the bigger picture. Yes, on the short term, 'antiheros' have been always ahead of the curve in utilizing it. This is why we see Western democracies now traumatized by several events in the political sphere, but the fact is these folks have always been there and have always been trying to influence the public in their own mind set. We are now more responsible and more capable in further educating people about intentions and policies. This, of course, does require that we now build better policies and more transparency than ever before. It also requires that political communication becomes more sophisticated and tech savvy. It will."

David J. Krieger, director of the Institute for Communication & Leadership, based in Switzerland, wrote, "The digital transformation supports values such as communication, participation, transparency, the free flow of information, connectivity and authenticity. On the basis of these values, democracy will become more responsive to citizens, who will be able to access more information, assess the value of information and participate in shaping and using information. A global socio-sphere will replace the traditional public sphere of political deliberation, reducing the importance of representative middlemen in democratic processes. More

forms of direct democracy will become not only feasible, but the only credible form of legitimation for democratic government. Not government, but governance will become an increasingly important form of regulation. Stakeholders in hybrid networks will become responsible for implementing cooperatively regulated datafication schemes that create value in many areas of society, including health care, education, business, scientific research and politics. These developments will be accompanied by cultural and ideological changes that depart from the convictions, values and traditions of Western industrial society."

Steven Miller, vice provost and professor of information systems at Singapore Management University, said, "As we continue our civilisation's and humankind's journey toward digitalisation, and the ongoing hybridisation of physical interactions and virtual/online interactions, we will see examples where these capabilities simultaneously strengthen our institutions and threaten them. … This is not new. It is as ancient as humankind and civilisation. … Somehow, some naive assumptions were made that these forces that have been with us for thousands of years would not be part of what would happen with the internet and then later with social network platforms. That was a naive assumption and proved to be wrong. Nothing that is happening is surprising – and we will continue to see wonderful social developments as a result of increasing digital connectedness, and simultaneously the co-occurrence of malevolence and ill intent."

Theme 4: Working for good: Governments, enlightened leaders and activists will help steer policy and democratic processes to produce better democratic outcomes.

Responses representing this theme:

Mary Alice McCarthy, senior policy analyst, Higher Education Initiative, New America, said, "Whether technology strengthens or weakens democracy depends fundamentally on the political will of representatives from both parties and their voters to support robust rules and regulations to govern how the internet can be used to spread information and how efforts to spread misinformation will be identified and penalized. I firmly believe that technology and the internet can strengthen democratic processes and institutions. They can do so by making voting easier and more convenient; enabling citizens to communicate more directly and immediately with their representatives; supporting organizing efforts by community-based organizations, unions and political parties; and enabling greater access to information on issues of importance to voters. But, as we have learned over the last decade – and particularly since the 2016 election, technology can also be a source of disinformation, radicalization and polarization. It can be used to spread lies, sow hate and create confusion about what is real and what is not."

Avery Holton, associate professor and vice-president's clinical and translational scholar at the University of Utah, commented, "If we are to look more than a decade down the road, we might be able to imagine a democratic system (in the broadest sense of the word) where politicians are actually held accountable for their actions and the content they share with the public. While social media spaces such as Facebook and Twitter are content to provide privilege to politicians (without clearly defining who exactly a politician is or may be), the legal and ethical platforms they use to support such an approach will have eroded by 2030. Laws will be in place to prevent disinformation and mal-information, especially of the most malicious kind, and those laws will apply to the full democratic society. There will be less of a hierarchy of information privilege and more of an accountability system. This will bring about a restrengthening of civil discourse and community built around the sharing of the truth, even its various forms, with the knowing that what is not truth is equally important and the labeling of it perhaps even more so."

Micah Altman, director, Center for Research in Equitable and Open Scholarship, Massachusetts Institute of Technology, wrote, "Society faces critical decisions of governance in the next decade. If we continue to make decisions piecemeal that cede small bits of privacy, transparency and accountability to corporations and government, we face potentially catastrophic losses of freedom. Technology is a powerful tool for democratic change. Independent commissions, empowered by participative mapping technology, are now our best hope for curbing gerrymandering and its corrosive effect on politics. Open science empowered by technologies for open publication, long-term data access and knowledge-mining are our best hope for making science more inclusive, effective and equitable – which has an immense long-term impact on societal well-being. Advances in cryptography and statistics-based technologies can help us reap the benefits of big data while avoiding privacy.

Theme 5: Assisting reforms: Pro-democracy governance solutions will be aided by the spread of technology and innovations like artificial intelligence. Those will work in favor of trusted free speech and greater citizen empowerment.

Responses representing this theme:

Stephen Downes, senior research officer for digital technologies with the National Research Council of Canada, commented, "The internet is gradually moving society from representative democracy to participatory democracy. It does this by creating the capacity for individuals or small groups to do things for themselves. People can educate themselves as a distributed community, they can mobilize themselves as a decentralized social network, and they can finance themselves using a digital currency. As always, it's the extreme and sometimes criminal cases that capture the headlines. But the real change to society is taking place among the rest of us, as day by day we

become more capable of organizing ourselves, and less reliant on the rich and powerful to do the organizing for us."

Stowe Boyd, consulting futurist expert in technological evolution and the future of work, responded, "In highly repressive states, new technologies to monitor citizens and control dissent will be employed to thwart democratic processes. In more democratic regions, we will see an increasing resistance to corporate and governmental application of technologies – like surveillance, artificial intelligence, and social media – to attempt to influence popular opinion and democratic processes. I've written about a 'Human Spring' where a majority of individuals in Western countries more or less spontaneously rise up in a general strike against the status quo, demanding a response to climate change, inequality and the hollowing out of work by AI and other advanced technologies. Perhaps 2023?"

Eline Chivot, a public-policy researcher for the Center for Data Innovation, commented, "From an optimistic standpoint, 21st century tools could enable more, rather than less, civic engagement. For instance, policymakers, elected representatives (such as mayors) and policy officials (such as diplomats) could use online platforms and various applications to respond to constituents' questions in real time, to involve them in decision-making processes at the local level, to gather more information from citizens' concerns, to solve any democratic deficit and gap between 'policymakers' and 'policy takers.' Artificial intelligence tools, for example, can be used or bring governments closer to citizens this way, mobilize citizens, build stronger constituencies. North Carolina's government is building chatbots to answer real-time constituency questions. The Singaporean government is using Microsoft-based chatbot systems to assist their citizens in key government services such as registration, licensing and utility management. Technologies can also improve government-to-government relations, level the playing field between big countries with significant capacity and resources to deal with the growing flow of information and smaller, understaffed nations. Natural language-processing tools in particular can cut down on research tasks, support the meaningful analysis of unstructured data at scale, make text easier to digest and facilitate the adoption of laws."

Shahab Khan, CEO at PLANWEL, based in Karachi, wrote, "In Pakistan we can FEEL the movement. It is quite logical and a foregone conclusion that in the years ahead proliferation of digital tools will definitely improve the governance and efficiency of democratic institutions."

There are many more answers about all of these themes beginning in Section 4 of this report.

2. Broader thoughts from key experts on the future of democracy at a time of digital disruption

The following expert contributions offer deep, broad insights that represent the diversity of thought expressed by leading expert commentators in this canvassing.

If we develop guardrails, the core elements of democracy will be strengthened

Amy Webb, founder of the Future Today Institute, wrote, "There are too many variables in play to predict just one plausible trajectory for the future of our democratic institutions. If we enter a decade of synthetic media without restrictions, increased algorithmic determinism and financial incentives that favor competition over collaboration, the core strengths of our democracies will have eroded. Citizens will be more vulnerable to misleading information and will be served the kinds of content that capture their attention. However, if we develop guardrails, norms and standards now that encourage transparency, authenticity and collaboration, our democratic institutions could be significantly strengthened. I see movement along both trajectories."

Ongoing "strategic distraction" and organized chaos lead to bitter partisan divisions

Barry Chudakov, principal, Sertain Research, said, "By 2030 I expect democracy to still be caught in a dilemma: freedom vs. intrusion. Civil liberties will continue to be a fraught area with digital xenophobes on one side concerned that 'others' will seek to harm democracy and so any countermeasures are justified, and civil libertarians on the other side who will argue that the surveillance state has gone too far and pushed democracy toward Big Brother Panopticon totalitarianism. Technology has already revolutionized our notion of what democracy means. It used to mean one person, one vote. Now it means, one device, one voice. Every voice will be heard via Twitter, Snap, YouTube, Facebook or Instagram. The question we will still be wrestling with in 2030: Who is this person? How will essential democratic institutions achieve authentication? The fundamental challenge to these institutions is – and will continue to be – identity. That is, the multiplication and falsification of identity, from which flows the falsification and distortion of information. At the same time, as we wrestle with confirming identity, democratic institutions confront the reality of the internet as a vast copy machine, where behaviors and attitudes can be mimicked and adopted like trying on a new shirt. What do we do when these behaviors and attitudes are reprehensible or downright evil? The copy machine remains, and we are left with our outrage – which is not enough. The ongoing threat to democracy is organized chaos. This strategic distraction deploys asymmetric information warfare to inflame social differences into bitter partisan divisions. While at the same time, because artificial intelligence systems designed to engage with humans will collect and convey increasing quantities of data, these systems must be built on empathy for the ethical development and deployment of AI."

"Our use of technology disconnects us from the local realities in which we live"

Douglas Rushkoff, well-known media theorist, author and professor of media at City University of New York, said, "I think the damage has already been done, or at least that the degree to which the public is misinformed remains fairly constant. Direct-mail campaigns from Republicans against John Kerry told voters that Kerry meant to take away their guns and Bibles. People in Czarist Russia were told that Jews conducted blood rites with murdered Christian children. It's hard to see social media or deepfake videos doing much more damage. So, when I say things will stay about the same between now and 2030, I take into account that they're already in pretty horrific shape. Democracy, as currently configured, isn't working so well in America, and tech exacerbates certain problems while also correcting others. The main way that tech impacts democracy is more subtle than disinformation and Russian propaganda. Our use of technology disconnects us from the local realities in which we live. While TV may have misinformed us about what was going on in the non-local world, our digital devices often keep us from even engaging with the local world. We become de-socialized, less empathetic. Less capable of thinking civically."

"There will be a lot of noise from politicians, not many solutions."

Mike Roberts, Internet Hall of Fame member and pioneer CEO of ICANN, said, "Among the effects of the internet on social discourse are 1) amplification of voices (often without enough thought behind them); and 2) a speeding-up of the action-reaction dimension of expression. We are currently in a phase of reaction to having allowed too much power to accrue to social media platforms. Consensus on remedies is difficult to achieve due to the factors above, and also because the problem itself is difficult to deal with. Perhaps the single most difficult aspect is moderation, i.e., censorship of expression – how far is too far, etc. We are lucky that the big platforms evolved in the U.S., with our history of First Amendment protections. So, bottom line, there will be a lot of noise, especially from politicians, not many solutions and not much overall movement."

Innovation in civic technologies can possibly enhance social cohesion, equity and justice

Alexander B. Howard, independent writer, digital governance expert and open government advocate, said, "Democracies will look a lot like they do today: stable, peaceful and equitable in countries that succeed in maintaining good governance, sclerotic and messy in flawed democracies captured by corporate influence, and devolving toward authoritarianism, or outright dissolving into civil wars in others. In the U.S., unless fundamental reforms have been enacted in some states that address money in politics, gerrymandering, government corruption and climate change, citizens will understandably remain skeptical about the meaning of their public participation in national elections, turning toward the endless rivers of infotainment and diversion instantly available on ubiquitous screens and projections. Many people will experience civic life through personalized feeds of infotainment from technology companies and media companies mixed with

digital services and information from municipal, state and federal governments and updates from our friends and family. Government agencies at every level will have replaced retiring Baby Boomers with automated services, augmented with artificial intelligence, putting a high premium on algorithmic transparency accountability and accessibility. Many more of the newspapers that play key roles in communities will be gone, and, despite the best efforts of state governments and foundations – and public media – radio and digital nonprofits won't replace all of their civic function everywhere, creating news deserts. That void will be filled up by the descendants of today's social media platforms and media companies, which will gain more power in shaping both conversations and civic participation. At the same time, continued innovation in civic technologies will have the potential to enhance social cohesion, equity and justice when they are deliberately built and designed with the public they connect and empower, enhancing the capacity of journalists, watchdogs and whistleblowers to make institutions transparent and hold powerful people and organizations to account for abuses of power. The role of schools and libraries as community hubs for information access and civic life will continue to be critical

Our brains may not be capable of dealing with emerging technologies of manipulation

Juan Ortiz Freuler, policy fellow at the Web Foundation, wrote, "Technology will be leveraged to increase the number of issues on which citizens are consulted directly. People will have a chance to engage in a greater number of public issues and will have access to more information regarding issues of public interest and how the state operates. Yet, in parallel, the degree to which citizens are surveilled is already increasing. A further-developed surveillance infrastructure will allow governments to easily clamp down on any form of participation that could affect core interests. The ways in which coordination between private-sector companies and governments on national security issues takes place today suggests that 'signals' of potential future crimes might increasingly lead to state interventions before any actual crime is committed. Furthermore, if the current trend toward allowing the private sector to both consolidate and run black-box algorithms for personalization and content-curation continues, these companies will take greater control over the shaping of public opinion. We've seen this trend, from surfing across blogs to find lists of links, to search engines that deliver a curated list, to artificial intelligence assistants (Siri, Alexa, Cortana) that deliver one specific reply to a query. Developments in augmented reality and virtual reality promise to increase this control further by allowing the companies that develop the tech to embed tailored information in contexts our brains won't be capable of distinguishing from the natural environment we evolved in over millennia."

Dominance of digital overlords is devastating to journalism, small businesses, governance

Andrew Nachison, chief marketing officer, National Community Reinvestment Coalition, commented, "In the U.S. between now and 2030, I see a mix of government inaction and perpetual

discord, and a mix of rising citizen activism and activation on the one hand, enabled by clever and increasingly capable tech platforms, and widening despair, detachment and digital dropouts. I worry that things will get worse, that inequality and corruption, which tech has done nothing to abate, will lead to violence and civil collapse. The dominance of a handful of digital overlords has brought us magical capabilities and services, like being able to search for information on nearly anything, or buy nearly anything you need, or keep up with friends, family and news, all with a few finger taps. But the costs have been devastating to local journalism, small businesses and governance. Facebook turns out to be the world's most powerful engine for censorship and political manipulation, and there's no sign it will do enough, on its own, to materially change itself. I also don't know that breaking up the company will change much. Facebook doesn't need Instagram or WhatsApp to be Facebook. Unless vastly stronger consumer protections are put in place to protect privacy, ensure transparency and put real control and economic benefit in the hands of content creators and users, Facebook will still be Facebook. Ditto for Google. But that's just the U.S. story, which is similar in the UK but not everywhere. State censorship and control of the internet seems to be on course to suppress and more or less crush democracy, and even talk of it, in places like China, Russia, Iran and North Korea. When governments can flip a switch and turn the internet off, it's hard to see how citizens stand a chance against repression. My optimism rests with progressive visions for digital governance and citizenship in outlier countries, like Estonia, and civic tech innovators promoting similar visions. Maybe they will succeed and spread. By 2030? I doubt it. I'm more hopeful for 2130."

"Advancement is far outstripping our ability to understand and govern it"

Susan Etlinger, industry analyst, the Altimeter Group, responded, "Technology advancement is far outstripping our ability to understand and govern it. Early in this decade, we began to see the implications of what we called 'big data' on privacy and human rights. As artificial intelligence and machine learning became more commonplace, different issues came into focus: perpetuation and amplification of bias, the need for transparency, the need for interpretability and auditability of algorithms, and, more broadly, the need for norms and governance structures for intelligent technologies. By the end of 2016, following both the U.S. and UK elections, we began to see how social media platforms could be used to weaponize information at scale and undermine the foundations of democracy. Now, as the decade comes to a close, we are starting to see synthetic data – e.g., data that is artificially created – become commonplace, along with 'deepfake' technology that can essentially create any kind of reality the creator desires. Today we have the ability to amass massive amounts of data, create new types of data, weaponize it and create and move markets without governance structures sufficient to protect consumers, patients, residents, investors, customers and others – not to mention governments – from harm. If we intend to protect democracy, we need to move deliberately, but we also need to move fast. Reversing the

damage of the 'fake news' era was hard enough before synthetic content; it will become exponentially harder as deepfake news becomes the norm. I'm less worried about sentient robots than I am about distorting reality and violating the human rights of real people at massive scale. It is therefore incumbent on both public and private institutions to put appropriate regulations in place and on citizens to become conscious consumers of digital information, wherever and however we find it."

If people "prefer peace over anarchy, tyranny is the more likely outcome"

Russ White, infrastructure architect and internet pioneer, said, "It is important to begin by noting a 'pure democracy' in itself is not necessarily the best form of government. Direct democracy tends to play into the worst aspects of mass media, particularly the media ecology built around internet technologies, producing mob rule. The question then becomes: Who controls the mob? Generally, this will be the strongest influencer(s), and the platform(s) they 'live on.' Given this, if technology companies continue along their current path, by 2030, democracy will be outwardly thriving, but inwardly failed. People will be able to vote, but their votes will be shaped by the commercial interests of the influencers and platform owners, rather than by deep reflection on the nature of humanity and justice. Either the social media platforms and influencers will take the situation in hand and control the mob through technological tyranny, resulting in peace, or they will not, resulting in anarchy. As people always prefer peace over anarchy, tyranny is the more likely outcome. The ideal, but not likely, outcome is that people will start taking responsibility for their knowledge and lives, and a techlash will develop around using technology responsibly. This path would result in (re)forming a republican, federalist government designed to allow maximum variation within beliefs while keeping the peace among various groups. Building this, however, requires acceptance of personal responsibility and social institutions who can take the lead – not likely/available in our current environment."

People need to be educated about manipulation techniques

Esther Dyson, internet pioneer, journalist, entrepreneur and executive founder of Way to Wellville, wrote, "Tech will both strengthen and weaken democracy, depending on how 'we' use it, and depending on how we define 'we.' Democracy depends on a shared sense of community and right now we are creating too many warring communities when we should be enlarging them. We also need to educate people on how they can be manipulated through tech and give them the understanding and the tools to manipulate themselves more effectively."

No authoritative information = no democracy

Isaac Mao, director, Sharism Lab, said, "Information and its channels are everything. Moving toward 2030, if we can't understand and regulate it well, then disinformation could totally

overwhelm people's limited bandwidth for input. Professional journalism and democratic institutions are eclipsed in such an emergency. There will be no authority of information, which will definitely mean no democracy. Technology is neutral, but will provide many wild ways to mislead people if big technology companies and totalitarian regimes control the information channels with lures and algorithms. Humans' brains can be easily misled to chase fake news, distorted facts and/or censorship traps without realizing it. They can't even find credible ways to verify the authenticity of information because every channel can be tainted. Even though individuals have gained the power of sharing, their voices are not easily heard. It's the biggest threat to our future."

There will be "anti-institutional, insurrectionist movements" seeking solutions

Ethan Zuckerman, director, MIT's Center for Civic Media, and cofounder, Global Voices, said, "The problems facing democratic institutions are less about technological change and more about a 40-plus-year slide in trust. Many institutions aren't working well for citizens of democracies. Technologies are helping people articulate their loss of trust, but they're also helping people organize outside traditional institutional channels. My prediction is that we'll see an increasing number of anti-institutional, insurrectionist movements that seek solutions by working around existing institutions and using technical tools as a key part of their movement building."

Political parties fracture as issue-based microtargeting becomes effective

Loren DeJonge Schulman, deputy director of studies and senior fellow, Center for a New American Security, previously senior adviser to National Security Adviser Susan Rice, said, "My expectation is that citizens will begin to put more of a premium on aligning with candidates or movements that 1) are able to tailor their engagement to the narrow interests of particular voters and 2) allow them to preserve their technology comfort zones while protecting them from technological threats. I believe parties will fracture, as voter and fundraising issue-based microtargeting becomes more feasible and effective. Individual polling could become less reliable as means of access to specific voter blocks declines or fragments across generational or value (e.g., privacy) divides."

In data-driven democracy, points-based participatory citizenship could be a status symbol

Thomas Frey, founder and senior futurist, DaVinci Institute, said, "Is there a difference between a good citizen and a great one? Is it OK to only do the bare minimum of what it takes to be a citizen? Would we be a better country if we all tried a bit harder? Citizenship means different things to different people. We typically have a back-of-the-mind rating system in place that tallies things like standing and singing during the pledge of allegiance, installing a flag on the front porch during holidays and openly thanking our veterans into an overall citizenship quotient. But should

there be a more formal ranking system, and more importantly, how would it be used? As a status symbol, the reinvention of citizenship is long overdue, and the possibilities are endless. We are moving quickly into a data-driven world where numeric values will be assigned to virtually everything we do. Here are a few quick examples: -File our taxes on time and we receive an additional 3,000 points, but for every day we're late, we lose 200 points. -Go in for regular health checkups we receive 1,000 points, but if we shrug off an appointment, we lose 2,000 points. -Receive a parking ticket we lose 1,500 points. Once we pay the fine, we get our 1,500 points back. -When an election is held, you receive 500 points for casting your vote."

"By 2030, we're likely to have long lost our willingness to believe most media outlets"

Jamais Cascio, distinguished fellow at the Institute for the Future, wrote, "Although in the longer run we're likely to develop effective counters to many of the politically pathological technologies, over the 2020s, the explosion of information-manipulation tools will outpace our ability to adapt to and contain those technologies. By 2030, we're likely to have long lost our willingness to believe most media outlets. Surrounded by falsehoods and fakes, we're more likely to ignore scandals than be outraged by them. The ease with which convincing fake images, audio and video can be created renders nearly all sources suspect; it's too easy to dismiss everything as false, and too often correct. However, when something does break through the barriers of skepticism, the reaction will often be disproportionately great. At the same time, we'll be in the early days of tools and practices that will help filter through the falsehoods and return a measure of trust to the system. They won't have broad use yet, but we'll start to see benefits."

We will adjust, but not without tension and informed public participation

Paul Jones, founder and director of ibiblio and a professor at the University of North Carolina-Chapel Hill, wrote, "Communications technologies, especially at their early adoptions, can be subject to centralization, control and exploitation, creating new identities (imagined communities) and, often, polarization within populations. But in the longer run, as the social formation of each technology is more established, communications enrich our daily lives and become the field and even background of our extended interactions. At the moment, democracy is both under attack and surging in the streets. Not to be caught up in presentism or to be utopian, but to be optimistic – our present technologies point toward more oversight, control and polarization, but in the longer run we have seen both mass media and personal communications tend to empower democratic institutions. By 2030, we will have adjusted to the abuses of data aggregation, of surveillance, of misinformation, and will be honoring – not without tension and required attention – informed public participation. Like the growing pains of democracy during the rise of newspapers, then radio, then TV, the adjustments will not be smooth, but they will be made."

These worrisome trends need not continue; we have adapted before and can do so again

Andrew Lippman, senior research scientist and associate director, the Media Lab, MIT, wrote, "Two things seem clear: 1) In the U.S. and some other countries, people have lost faith in the traditional institutions that build a common social core. In part, this is due to the multiplicity of outlets that address fringe elements. These were not economic in the past when there was more friction in publishing. 2) The increased use of artificial intelligence manipulation of data and the visceral impact of much news allows falsehoods to penetrate more effectively than in the past. This does not bode well for an informed and thoughtful populace in the near term. However, I am not in a position to gauge how much this is the fault of the internet or of other aspects of society, of which there are many. Nor do I think that the current trends need continue. We have generally been able to adapt to media evolution and invention, so I suspect that we can do so again, although it may take some real work."

We are undergoing important change in our conception of free speech

David Weinberger, senior researcher at Harvard's Berkman Klein Center for Internet & Society, said, "Who knows?… We're undergoing an important change in our conception of what 'free speech' means. We could afford to let speech be much freer back when so few voices could actually be heard and the range of opinions was far more constricted. Back then, the filtering out of harmful ideas was accomplished by only giving the mic to a homogenous set of folks. (White men of a certain class, if you were wondering.) Now that everyone has the mic, the filtering – if we decide we actually prefer our free speech to stay within particular boundaries – has to be done by the platforms. So, it's quite possible – but who knows? – that the online platforms where we hear the bulk of public speech will enforce limits that in the past we would have rejected as overly inhibiting – not only on hate speech, but also on speech that promotes ideas that we consider to be harmful to the public weal. There's certainly a slippery slope possible here, but, as with all slippery-slope arguments, that's only a problem if we choose to slide down it. It's also possible that platforms will segregate according to which sets of views they find harmful, in which case the divisions among us will get yet more severe."

"Will the nation-state as we know it survive intact? No way to yet tell"

Jeff Jarvis, director of the Tow-Knight Center and professor of journalism innovation at City University of New York, wrote, 'The internet as a grand network connecting people with people, people with information, information with information and machines with machines. Already we see, for example, that new voices not represented by institutions including government and mass media can now speak. Thus, we have, for example, #metoo and #livingwhileblack. Thus, we also have a backlash from entrenched forces – read: old, white men – who fear loss of power and who so far would seem to rather destroy institutions than share power in them. Who will win? There is

no way to yet tell. We also see globalization not only in commerce – affecting jobs and economies – but also in social interaction. Thus, borders are challenged and so are nations. Is this challenge a reason why we see the rise of nationalism? We see now that wars can be fought with data and without national armies or weapons. We see that virtual currencies can challenge the monetary power of nations. Will the nation-state as we know it survive intact? No way to yet tell. At the same time, governments are trying to regulate the net – which actually means they are trying to regulate the behavior of citizens on the net – goaded on by their own worries and by the spending of political capital by legacy media and other threatened industries and institutions. Can the net, built to withstand the disruption of nuclear attack, withstand effort to balkanize it by government? Will liberties prevail? Too soon to know."

Digitization is "the biggest thing since oxygenation"

Doc Searls, internet pioneer and longtime editor-in-chief of Linux Journal, said, "In these early years of our new digital age, social media (a collection of new and likely epiphenomenal developments) in particular are amplifying homophily: the tendency of people to gather among those with whom they share characteristics, loyalties, affinities and other forces that attract people into tribal groupings. Blaming and demonizing other tribes comes naturally to humans, and we're at a stage right now when doing that is just too damn easy. We'll get past it, but in the meantime, tribalism is making enemies of groups that used to merely disagree. This naturally affects governance in all forms, especially democratic ones. We are in the early stages of the Digital Transition: a time when everything that can be digitized is being digitized. This includes all forms of studying, communicating and remembering things. Plus, everything that doesn't need to be physical: a sum that is huge beyond reckoning. Recently I asked Joi Ito, at that time the head of MIT's Media Lab, how big this is. 'Is it bigger than electricity?' I asked. 'Movable type? Writing? Speech? Stone tools?' 'No,' he said. 'It's the biggest thing since oxygenation.' That happened around 2.5 billion years ago. And I think he's right: It's that big."

Hope for greater participation in the most fundamental democratic processes

Gina Glantz, a political strategist and founder of GenderAvenger, said, "I want to believe that the dark underbelly of the digital world that is distorting democracy will be exposed and its impact lessened over the next decade. I hope by 2032 safeguards will have been created so that voting can take place electronically, encouraging much greater participation in the most fundamental of democratic processes."

"Casual participants vastly outnumber engaged and thoughtful ones"

Larry Keeley, cofounder of Doblin and professor of innovation at Kellogg Graduate School of Management and IIT's Institute of Design, said, "Technology will, of course, both materially

strengthen and weaken participative democracy. The 'balance' will depend on individual users. Sophisticated users will be able to harness more and better tools for evaluating political issues, topics, candidates and 'leaders.' They will increasingly be able to see integral fact-checking, historic patterns, even be able to use predictive analytics tools to evaluate what that individual is likely to prefer in the future. Indeed, there will be a new class of tool emerging that will allow any of us – even curious elected officials (wherever they may still be found) to use simulators to manage complex questions, such as: Should we have higher or lower minimum wages? How about a guaranteed minimum income? Should we invest in more or less health care, and focused on which ages in particular? Should we invest in more infrastructure? How much? Should we give everyone free high-speed Wi-Fi? Etc. Of course, at the same time, for unsophisticated users, there will be ever more (and more sophisticated) tools designed to engage, enrage, compel, cater to and amplify one's previously held views, prejudices or suspicions. These tools will be everywhere. So, I answered that, on balance, technology will hurt participative democracy, simply because I think casual participants vastly outnumber engaged and thoughtful ones. Wish that were not the case. Neil Postman nailed it with his title: 'Amusing Ourselves to Death' – and he wrote that book BEFORE the advent of the internet."

Technology will be used to control citizens; perhaps also to decrease atmospheric carbon

Barbara Simons, past president of the Association for Computing Machinery, commented, "If climate change is not treated as an emergency and as the existential threat to civilization and much life on earth that it is, civilization as we know it will be destroyed. In all likelihood, non-democratic regimes will be created that are fascist in nature because of the limited amount of resources available. Technology will be used to control citizens. Perhaps it also will be used to decrease the amount of carbon in the atmosphere, but that remains to be seen."

Democracy is challenged by an Asian model of governance in a complex environment

Philippe Blanchard, founder of Futurous, an innovation consultancy based in Switzerland, said, "The democratic model was born as a philosophical response similar to the 'wisdom of the crowds.' The collective decisions would be the best solution to find answers answering the needs of the community as well as ensuring the cohesiveness of the community. We are now living in more complex, multidimensional environments: 1) That complexity means that it is more difficult for the general public to understand the impacts of the political decisions. 2) The pace of change (technology, sociology) is conflicting with the institutional pace. In addition, we need to review different elements to ensure the relevancy of democracy: 1) Education of the citizens, and accessibility of information 2) Institutional structures of representation (direct democracy vs. indirect) 3) Regulation. But we need also to understand the fundamental differences in our respective cultures. The Greek philosophy structured the Western thinking (primacy of the

concept, the model as per Plato's idea) versus the Chinese/Asian philosophy, where the context prevails over the concept (Qi, the energy). The Chinese philosophy of efficiency only arises from the question of the 'coming' and not of 'being' and metaphysics. It does not ask the question of the self, the subject or the separation of practical theory but only the question of efficiency from the natural course of things. It is interested in the process, the procedure that leads to rather than the state. What interests the Chinese philosophy is therefore not the action but the 'potential of the situation,' which contains its own transformation. The availability of big data is therefore the best way to assess and influence this potential of situation. Alongside the availability of the tools, the question of 'democracy' is therefore also challenged as the only relevant governance model."

Will the future serve a wider range of interests than profit incentives?

Anthony Nadler, associate professor of communication studies at Ursinus College, and fellow at Columbia University's Tow Center for Digital Journalism, said, "One way of thinking about technological development is as a process of discovery and innovation that simply unfolds along a predestined path. But I hope the techlash helps to challenge this way of thinking about the future of technology. When it comes to issues like the growth of online disinformation or exploitation of user data – just to draw on a couple poignant examples – today's tech crisis is not simply the inevitable outcome of digital technology. These problems stem from particular choices about how our contemporary digital architecture has been designed to serve the commercial purposes of the dominant players in the market. The question for the next 10 years, then is not simply a matter of what new technologies will be invented or which technical problems will be solved. It's going to be a matter of … which groups and whose perspectives will have a decisive input into how technology is designed and what values and goals it will be built to prioritize."

The remaining sections of this report share thousands more predictive comments from technology experts and futurists as they elaborate on the potential future of democracy in the digital age, sharing their views on today's trends and what they mean as we enter the next decade of digital life. Their comments are gathered under the specific themes that were briefly highlighted at the start of this report. Many of the answers cross over to touch upon multiple aspects of the digital future most do not neatly address only aspect of the likely future. Some responses are lightly edited for style and readability."

3. Concerns about democracy in the digital age

About half of the experts responding to this canvassing said people's uses of technology will mostly weaken core aspects of democracy and democratic representation, but even those who expressed optimism often voiced concerns. This section includes comments about problems that were made by all respondents regardless of their answer to the main question about the impact of technology on democracy by 2030. These worries are organized under seven themes.

Empowering the powerful: Corporate and government agendas generally do not serve democratic goals or achieve democratic outcomes. They serve the goals of those in power

An internet pioneer and technology developer and administrator predicted, "My expectation is that by 2030, as much of 75% of the world's population will be enslaved by artificial intelligence-based surveillance systems developed in China and exported around the world. These systems will keep every citizen under observation 24 hours a day, seven days a week, monitoring their every action."

Dan Gillmor, technology writer and director at the Knight Center for Digital Media Entrepreneurship at Arizona State University, commented, "Governments (and their corporate partners) are broadly using technology to create a surveillance state, and what amounts to law by unaccountable black-box algorithm, far beyond anything Orwell imagined. But this can only happen in a society that can't be bothered to protect liberty – or is easily led/stampeded into relinquishing it – and that is happening in more and more of the Western democracies. The re-emergence of public bigotry has nothing to do with technology, except to the extent that bigots use it to promote their malignant goals. Meanwhile, the institutions that are supposed to protect liberty – journalism among them – are mostly failing to do so. In a tiny number of jurisdictions, people have persuaded leaders to push back on the encroachments, such as a partial ban on government use of facial recognition in San Francisco. But the encroachments are overwhelming and accelerating."

Leah Lievrouw, professor of information studies at the University of California-Los Angeles, wrote, "To date, virtually no democratic state or system has sorted out how to deal with this challenge to the fundamental legitimacy of democratic processes, and my guess is that only a deep and destabilizing crisis (perhaps growing out of the rise of authoritarian, ethnic or cultural nationalism) will prompt a serious response."

Seth Finkelstein, programmer, consultant and EFF Pioneer of the Electronic Frontier Award winner, wrote, "Warren Buffett has said, 'There's class warfare, all right, but it's my class, the rich class, that's making war, and we're winning.' We can examine how this class warfare changes with advances in technology, analogous to how military warfare has been affected by technology. But no weapons technology to date has inevitably produced democracy over dictatorship (or vice-versa). For example, there once was a type of boosterism that talked about how ordinary people could make websites and promoted its very rare *cause célèbre* success. But that storyline is now going out of fashion. It's finally getting to be pundit knowledge that there's a whole system behind which material gets promoted. Paid professional liars can both make websites themselves and work this system better than amateurs. There's currently a national panic over Russian trolls. But native fiends can do the same thing, with more skill, incentive and opportunities."

David Bray, executive director for the People-Centered Internet Coalition, commented, "The power of narratives is exactly their ability to shape and institutionalize norms and power distribution in our human communities. … Now, however, our world is much broader than our immediate environment, and this has dangerous side effects, such as challenges in reaching consensus or disputing the relevant facts for a situation. We are seeing increasing polarization in open societies, partly as a result of these questions of where we want to go not being considered in ways that can translate to action. An even larger question is where do different localities want to go in terms of progress in parallel to what values or norms they want to hold dear? This is a question that spans sectors. No one organization or influencer or group with power can either solely answer or execute actions toward that desired future state. In the absence of finding ways to build bridges that span sectors, power – through narratives, laws, or technologies – will be grabbed by whomever aspires to this. An important question for the future is can we build such bridges across sectors? Will our divisions be our undoing as open, pluralistic societies? Can we develop narratives of hope for open, pluralistic societies that bring people together?"

Miguel Moreno, professor of philosophy at the University of Granada, Spain, an expert in ethics, epistemology and technology, commented, "There is a clear risk of bias, manipulation, abusive surveillance and authoritarian control over social networks, the internet and any uncensored citizen expression platform, by private or state actors. There are initiatives promoted by state actors to isolate themselves from a common internet and reduce the vulnerability of critical infrastructures to cyberattacks. This has serious democratic and civic implications. In countries with technological capacity and a highly centralized political structure, favorable conditions exist to obtain partisan advantages by limiting social contestation, freedom of expression and eroding civil rights."

Richard Jones, an entrepreneur based in Europe, said, "Government will lag exploitation of data by state and corporate actors in unforeseen ways. Biased censorship (both well-intentioned and corrupt) and propaganda onslaughts will shape opinions as – combined with an anti-scientific revolution – confidence in the institutions and establishment figures essential to peaceful orderly improvement of societies crumbles further. Hysterical smear attacks will further intensify as attempts to placate minority pressure groups continue. Biased technocratic groupthink will continue its march toward authoritarianism. Charismatic leadership will flourish in truly liberal systems. Authoritarianism will take root elsewhere. Online preference surveys may be developed to guide many choices facing government, but it is not clear that can correct the current democratic deficit in a helpful way. As during the Gutenberg process, accompanying the digestion of 'free-range' information will be the reevaluation of secular and religious values and objectives."

John Sniadowski, a systems architect based in the United Kingdom, wrote, "It is proving very difficult to regulate multinational corporations because of the variety of different national government agendas. A globally enacted set of rules to control multinationals is unlikely to happen because some sovereign states have very illiberal and hierarchical control over agendas and see technology as a way to dominate their citizens with their agendas as well as influence the democratic viewpoints of what they consider to be hostile states. Democracy in technological terms can be weaponized."

Kevin Gross, an independent technology consultant, commented, "Technology can improve or undermine democracy depending on how it is used and who controls it. Right now, it is controlled by too few. The few are not going to share willingly. I don't expect this to change significantly by 2030. History knows that when a great deal of power is concentrated in the hands of a few, the outcome is not good for the many, not good for democracy."

Robert Epstein, senior research psychologist at the American Institute for Behavioral Research and Technology, said, "As of 2015, the outcomes of upward of 25 of the national elections in the world were being determined by Google's search engine. Democracy as originally conceived cannot survive Big Tech as currently empowered. If authorities do not act to curtail the power of Big Tech companies – Google, Facebook and similar companies that might emerge in coming years – in 2030, democracy might look very much as it does now to the average citizen, but citizens will no longer have much say in who wins elections and how democracies are run. My research – dozens of randomized, controlled experiments involving tens of thousands of participants and five national elections – shows that Google search results alone can easily shift more than 20% of undecided voters – up to 80% in some demographic groups – without people knowing and without leaving a paper trail (see my paper on the search engine manipulation effect). I've also shown that search suggestions can turn a 50/50 split among undecided voters into a 90/10 split –

again, without people knowing they have been influenced. The content of answer boxes can increase the impact of the search engine manipulation effect by an additional 10% to 30%. I've identified about a dozen largely subliminal effects like these and am currently studying and quantifying seven of them. I've also shown that the 'Go Vote' prompt that Google posted on its home page on Election Day in 2018 gave one political party at least 800,000 more votes than went to the opposing party – possibly far more if the prompt had been targeted to the favored party."

A longtime internet-rights activist based in South Africa responded, "Whether the powers of states and tech corporations can be reined in effectively is the current struggle. The genie is out of the bottle and it does not bode well for systems of democracy that have already been undermined in Western states. A state of global cyber war now exists and is likely to persist over the next decade. The oligopoly of state-supported tech companies, whether in the U.S. or China, will be difficult to break. It is trite to differentiate between a Google or an Alibaba – both received substantial state support from their respective governments – the Googles by failure to apply antitrust law to prevent monopolization, the Alibabas by state protection against competition in China."

David P. Reed, a pioneering architect of the internet expert in networking, spectrum and internet policy, wrote, "'Democracy' in 2030 will be democracy in name only. The mechanisms of widespread corporate surveillance of user behavior and modification of user behavior are becoming so sophisticated that the citizen interests of democratic-structured countries will no longer be represented in any meaningful way. That is, by collecting vast amounts of information about user preferences and responses, and the use of highly targeted behavior modification techniques, citizens' choices will be manipulated more and more in the interests of those who can pay to drive that system. The current forms of democracy limit citizen participation to election events every few years, where issues and candidates are structured by political parties into highly targeted single-vote events that do not represent individuals' interests. Instead, a small set of provocative 'wedge' issues are made the entire focus of the citizen's choice. This is not representation of interests. It is a managed poll that can easily be manipulated by behavior modification of the sort that technology is moving toward."

A pioneering technology editor and reporter for one of the world's foremost global news organizations wrote, "I do not have great faith that the institutions tasked with ensuring that online discourse is civil and adheres to standards of truth and fairness will be able to prevail over tendencies of autocratic governments and powerful private sector actors to use cyberspace for narrow political ends. … The internet has never had an effective governing body with any considerable clout to set policy that might guarantee network neutrality on a global scale, inhibit censorship and apply such conventions as the Universal Bill of Human Rights. Further, a handful

of platforms whose moral compass has been questioned have come to dominate the online world. Some are dominated by governments. Others owe allegiance only to shareholders."

Jerry Michalski, founder of REX, the Relationship Economy eXpedition, wrote, "'Capital G' Government has devolved into a phony consumer mass-marketing exercise. 'Small g' governance could involve active, ongoing collaboration among citizens, but it won't as long as the major platforms they use have as their business models to addict them to TikTok videos, and to sell off their private data to companies that want to stalk them."

Jonathan Kolber, author of "A Celebration Society: Solving the Coming Automation Crisis," said, "Deepfakes will completely muddy the difference between facts and falsehood, a distinction that few citizens are equipped to make even now. This will have devastating effects upon democratic institutions and processes. … We are increasingly seeing George Orwell's nightmare unfold as governments learn to use internet-enabled smart devices (televisions, smartphones, etc.) for surveillance. When the Internet of Things extends to smart cars, smart homes and so forth, the surveillance will be universal and unending. Governments are also increasingly redefining facts and history."

A professor of computer science said, "Artificial intelligence technology, especially machine learning, has a feedback loop that strongly advantages first movers. Google's advantages in being a better search engine have now been baked in by its ability to accumulate more data about user search behavior. This dynamic is inherently monopolistic, even more so than prior technological advances. Persuasive technologies built using these technologies are capable of refining and shaping public opinion with a reach and power that totalitarian governments of the 20th century could only dream of. We can be sure that today's regulatory mood will either dissipate with nothing done, or more likely, become a driver that entrenches existing monopolies further by creating technical demands that no competitor can surmount. Democratic institutions will have a very difficult time countering this dynamic. Uber's 'greyball' program, intended to defeat regulation and meaningful audit, is a harbinger of the future."

Jonathan Taplin, author of "Move Fast and Break Things: How Google, Facebook and Amazon Cornered Culture and Undermined Democracy," said, "Social media will continue to enable new and more-sophisticated forms of propaganda and disinformation. Artificial intelligence will enable deepfake videos that the average citizen will be taken in by. Facebook, YouTube and Twitter will continue to enable this content in their unending chase for revenue. Politicians will make noises about regulation, but since these platforms will become their primary source of advertising and publicity, they will never commit to the elimination of Safe Harbor and other rules that protect the social networks."

Bulbul Gupta, founding adviser, Socos Labs, a think tank designing artificial intelligence to maximize human potential, responded, "Given the current state of tech and artificial intelligence ownership, I expect democracy to be even more unequal between the haves and have-nots by 2030, and a major uprising happening from the masses who are being quickly left behind. Tech and AI are owned by their creators, the top 1%, with decisions made about the 100% in every sector of society that have little to no transparency, human judgment or much recourse, and that may not get made the same if they were being forced to happen face to face. People will need their own personal AIs in their corner to protect their basic civil and human rights."

Carlos Afonso, an internet pioneer and digital rights leader based in Rio de Janeiro, Brazil, wrote, "Thomas Piketty and others demonstrate that inequality is, if anything, rising everywhere. Democracy understood as pluralist participation in political processes involving the electoral (supposedly unbiased) choices of government representatives, and the decision-making processes in building policies, legislation and regulation, cannot survive in these conditions. … One of the greatest achievements of the UN community was the consensus agreement on trying to reach the 17 sustainable development goals by 2030. However, conflicts of all kinds, internal and inter-country, give us no hope that the essential components of those goals will be achieved worldwide. Also, there is (partly in consequence of the various manifestations of a growing economic crisis with the financial speculators at the head of these processes) little chance that resources will increase to cover the essential needs of the majority."

James Sigaru Wahu, assistant professor, media, culture and communication, New York University and fellow at Harvard's Berkman Klein Center, wrote, "As we have seen across the Global North, tech has only worked to make worse offline tension. This has resulted in multiple challenges toward notions of democracy as shown by the Brexit debacle, 2016 presidential elections and violence against immigrant groups. We have also seen states get in the act through the use of technology to expand their surveillance powers, as is the case in China and in the UK (with its large CCTV camera presence). States in the Global South have also gotten into the surveillance game, which does not bode well for organizations and people advocating for human rights. What we have thus seen is countries like Russia and China growing in strength in tech surveillance and misinformation/disinformation while the United States and several police departments across the country rely on companies such as Palantir to expand their surveillance on citizens. Both of these have led to disastrous results."

Lokman Tsui, professor at the School of Journalism and Communication of The Chinese University of Hong Kong, formerly Google's Head of Free Expression in Asia and the Pacific, said, "The political economy of new technologies that are on the horizon leaves me with many concerns for how they will impact democracy and its institutions. First, many of the new technologies,

including artificial intelligence, machine learning and big data, are closed and centralized in nature. Unlike the open web before it, these technologies are closed and centralized, both in terms of technical design and also in terms of business model. The technology can indeed be used to improve democratic institutions and processes, but it will be hard and there will be many obstacles to overcome. Second, the new technologies are not only not helping democracies, but they, by their design, are also helping and strengthening non-democracies to further censorship and surveillance. While there are also technologies to counteract these tendencies, the balance tends to tip (heavily) in favor of the other side. Third, I'm concerned there is a global rat race toward the bottom when it comes to the collection of (personal) data, which has the potential to enable the suppression of many other rights."

Norton Gusky, a futurist and advocate for implementing technology to empower people, commented, "For many years I truly believed that the internet would bring greater access to information that would strengthen democracy. However, in the past four to five years, I've witnessed a darker side to the internet. We now see countries like Russia interfering in the elections of not just the United States, but other countries throughout the world. I think there will be a swing, but for the next two to four years, the darker forces will prevail. We'll see countries like Turkey, China and Egypt limiting the access to the 'truth.' Even former pillars of democracy, Britain and France, are challenged by forces misusing digital tools."

Paola Ricaurte, fellow, Berkman Klein Center for Internet & Society, wrote, "Even after we are aware of the negative implications that technology can have on democratic processes, we have not seen significant actions by the U.S. government to limit the power of tech corporations. The extraterritorial control of technology companies will be further expanded and will continue to have consequences for the democracies of the Global South. The knowledge gap between data-rich countries and data-poor countries will deepen."

Ian O'Byrne, assistant professor of education at the College of Charleston, wrote, "Power and money ultimately influence decisions made by democratic bodies. With growing unrest, citizens can use social media and current/new digital tools to make themselves heard. Ultimately this will be pushed back again by existing powerholders and nothing may ultimately change. The existing powerholders will continue to exert their influence, and citizens will be left to continue to voice their opinions by shouting into the cyberverse."

Jeffrey Alexander, senior manager for innovation policy at RTI International, said, "In societies where people are accustomed to power being centralized in a few institutions, and where central governments already exert power through surveillance and state authority, digital technology will facilitate intimidation, disinformation and other mechanisms for reducing individual liberty,

suppressing minority opinion and enforcing authoritarian control. This will enable such governments to enhance the appearance of following democratic norms, such as offering 'free and open' elections, but use those mechanisms to reinforce their power by suppressing dissent well before voters reach the polls. In societies with strong individual education and a tradition of liberty and citizen-driven initiatives, digital technology could help thwart the rise of authoritarian rule, improve oversight and governance of law enforcement and policy processes, and enhance citizen involvement in government and politics."

John Pike, director and founder of GlobalSecurity.org, said, "Democracy in 2030 will face the best of times and the worst of times. All the optimistic predictions about social media and other online implementations strengthening citizen participation will be realized. All the pessimistic predictions about the ease with which the surveillance state can manipulate public opinion will also be realized. Autocratic regimes such as Russia and China are skilled at such dark arts at home and will practice them globally. In the old days it was pretty obvious that the Communist Party USA member hawking the Daily Worker was working for Moscow, but now attribution is difficult and contested."

Shane Kerr, lead engineer for NS1 internet domain security, said, "Those with resources will be able to harness technology more effectively to influence opinion and policies, ultimately working against democratic ideals. We already see this in a nascent form today, but it will likely evolve into such a pervasive narrative that the average citizen will not even be aware of it, unless they study history (assuming that '1984'-style revisionist history does not become the norm)."

David Golumbia, an associate professor of digital studies at Virginia Commonwealth University, wrote, "Unless there is a massive change to democratic control over digital technology, that technology will continue to erode democracy as it was designed to do and as its most ardent advocates openly say they want, despite [the fact that they] sometimes use the language of democracy and allied values like free expression to justify their antidemocratic actions. I am cautiously hopeful that governments and citizens are waking up to the powerful antidemocratic forces that are coded into our technology and the culture that informs and empowers it. … While I hope that things will improve, the tremendous amounts of money and power dedicated to making sure they don't improve frighten me, as do the uses of this technology in states that do not even try to appear to be democracies."

Sasha Costanza-Chock, associate professor of civic media at Massachusetts Institute of Technology, wrote, "Core aspects of the democratic process are deeply stressed or broken. In the United States, we need significant reforms to enable broader and more meaningful participation in democratic decision-making, such as instant runoff or rank-order voting, expansion of voting days

and times, expanded voting rights for formerly incarcerated people, campaign finance reform, rethinking the electoral college and much more. Unfortunately, most of these are extremely unlikely. Instead, we seem locked into an elitist and extremely expensive electoral system where the players with the most money and connection to wealthy backers rig the system to their advantage. In this context, many technological tools primarily advance those who can develop and customize them for their own ends – again, the biggest players. There are some countervailing forces such as the ability of insurgent candidates to leverage social media."

Denise N. Rall, academic researcher of popular culture, Southern Cross University, New South Wales, Australia, said, "I believe technology will help the dictators that we now have stay on top and control more aspects of all of our lives, worsening the prospects for democracy as has already happened in most economic powerhouses of the world (U.S., Russia, China, and right-wing elections in Europe, the absurdity of Brexit in the UK, North Korea, etc.). I think environmental degradation will increase exponentially and people will be fighting over resources like energy, water and food quite soon. I do not think technology will have the power to change these outcomes without real desire by governments to reduce resource consumption and a global birth control program of some kind."

An anonymous respondent commented, "China has the potential to stall trends toward democracy and regime change through increased monitoring of their citizenry and refinement of their 'social credit' legislation/monetization of following the whims of their single party. There is a potential for China to help prop up regimes in developing countries where they have vested interests by distributing such technologies to undemocratic regimes that want to remain in power. I think that India could go either way depending on whether or not widespread corruptions in their political environment exploit or are thwarted by increased access to technology and information by their citizenry."

Richard Lachmann, professor of political sociology at the State University of New York-Albany, said, "Democracy will continue to weaken but technology is only a secondary factor. More important in the decline of democracy are the disappearance or weakening of labor unions, the growing power of corporations in all sectors due to mergers, extreme levels of inequality and the ability of the rich and of political actors to manipulate 'veto points' to paralyze government initiatives, which then increases citizens' cynicism about politicians and lessens their participation. All of these preceded the expansion of the internet and will not be significantly lessened by citizens' online activities."

Vince Carducci, researcher of new uses of communication to mobilize civil society and dean at the College of Creative Studies, wrote, "Institutional changes are occurring more as a function of

power and money rather than technology, particularly in the selection of candidates and in the judicial system. Those are more of threat than technology."

A cofounder of one of the internet's first and best-known online communities wrote, "Democracy is under threat. The blame can't ultimately go to the internet or to computer-aided automation or to artificial intelligence. The vast power of personal and corporate wealth to wield these technologies in support of their selfish interests will increasingly suppress egalitarian and democratic values."

A research scientist for a U.S. federal agency wrote, "We are in a period of growing isolationism, nativism and backlash that will weaken democracies around the world, and it will probably have reached a peak by 2030. Although technology and online dissemination of information will be a tool of information and disinformation, and it will be a tool of policing populations, the underlying economic and environmental shifts are mostly responsible for changes resulting in weaker democracies."

A retired professor commented, "Corporations will have more power over employees and customers. This will be achieved as part of the ongoing corporate takeover of democratic institutions, which U.S. President Eisenhower warned of long ago. Technologies of identification and surveillance will expand in usage, eating away at the private sphere of social life. Social media will continue to reinforce strong social ties among family and friends while reducing the formation of the weak social ties among acquaintances that support intergroup cooperation necessary in a diverse society. Worsening climate and its consequences for health, agriculture and infrastructure will create increasing irrational forms of blame and global conflict. Global conflicts will include electronic and biological forms of aggression against the militarily powerful countries. More citizen backlash is to be expected, but will likely be directed against inappropriate targets. Societies as we know them will stumble from disaster to disaster, toward a massive die-off of our species. I hope I'm wrong. I would like to see our species survive with its democratic values intact. I have grandchildren. I would like their grandchildren to inherit a better world than the one that our present technocratic capitalist economy is racing toward."

Anonymous respondents commented:

- "The internet under capitalism will only serve the few, not the many, and democracy will weaken as a result. The problem is about competitive economic imperatives rather than technological affordances."
- "It's not the technology that will cause the changes, but the systems and structures that create various tech."

- "The loudest voices will continue to be those that are heard. While the media may change, the elite will still run everything."
- "Technology companies and governments have incentives to avoid doing things to address the damaging ways in which internet platforms damage democratic institutions."
- "Power corrupts. Look at the tech giants today – manipulation and propaganda. They are elitists who think they know best."
- "The combination of big data and supercomputing power seems to be having a negative effect on democracy, and I see no signs that that can be effectively policed or regulated, particularly given the power (and data troves) of very large internet companies and of governments."
- "I do not believe that governments understand the tools, and they will fail repeatedly to regulate or organize them properly; I also do not have faith the private companies are democratic, and therefore they are apt to reinforce capitalism alone, not democracy."

Diminishing the governed: Digitally networked surveillance capitalism creates an undemocratic class system that pits the controllers against the controlled

Charles Ess, professor of digital ethics, at the University of Oslo, said, "Democracy – its foundational norms and principles, including basic rights to privacy, freedom of expression and rights to contest and conscientiously disobey – may survive in some form and in some places by 2030; but there are many strong reasons, alas, to think that it will be pushed to the margins in even traditionally democratic countries by the forces of surveillance capitalism, coupled with increasing citizen feelings of powerlessness against these forces, along with manipulation of information and elections, etc. Not to mention China's increasingly extensive exports of the technologies of 'digital authoritarianism' modelled on their emerging Social Credit System."

Rob Frieden, a professor of telecommunications law at Penn State who previously worked with Motorola and has held senior policy positions at the Federal Communications Commission and the National Telecommunications and Information Administration, said, "Technological innovations appear better suited for expanding government power versus improving the ability of individuals to evade surveillance. Across the entire spectrum of political ideology, national governments can justify increased budgets for ever-more-sophisticated surveillance technologies based on noble-sounding rationales, such as national security. Governments have little incentives and incur even fewer penalties when they fail to calibrate surveillance technology for lawful reasons. Innocent people will have reasonable privacy expectations eroded, particularly with technologies that have massive processing power and range coupled with an ambiguous mandate. Unless and until citizens push back, governments will use surveillance technologies to achieve goals beyond

promoting national security. We risk becoming inured and numbed by ubiquitous surveillance, so much so that pushback seems too difficult and unproductive."

Gina Neff, senior research fellow, Oxford Internet Institute, studying innovation and digital transformation, wrote, "There is simply no reason to believe that technology can strengthen democracy. Western democracies are grappling with the power from the increased concentration of financial capital and its response in the form of the rise of populism. Without attention to strengthening our core technology and communications infrastructure, those forces will continue to damage how people participate in – and indeed make – democracy."

Zizi Papacharissi, professor of communication and political science, University of Illinois-Chicago, responded, "Our present system of governance supports strong capitalism/soft democracy. Until this balance is reorganized, to support soft capitalism/strong democracy, any technology we create will continue to underserve democracy. In short, the technology we have created was designed to generate profit, not to support democracy. It is possible to do both. We just have not designed it that way, however. By 2030, we will see a weakening of democratic and political processes facilitated by technology. This will happen not because there is something inherently bad or undemocratic about technology. It is because most technology is designed, implemented and/or deployed through mechanisms that support a strong capitalist model that was created centuries ago and needs to be updated in order to be compatible with contemporary societies, democratic and non."

John Harlow, smart-city research specialist in the Engagement Lab at Emerson College, said, "Although there is rising anti-monopoly sentiment, 2030 is soon, and the dominant digital commons for speech (Facebook, Twitter, YouTube) are likely to draw out (in the courts) any regulatory action to change their business models and/or practices. Currently, they are governed by algorithms designed to maximize 'engagement' time and thereby advertising revenue, and those algorithms have prioritized extreme content over accurate content (among other problems). This has enabled and supported the rise of the authoritarian far right the world over, and has destabilized faith and participation in democratic institutions and processes."

An expert on online trust and identity active in the multistakeholder organizations that build and maintain the internet said, "Uses are shaped by social and economic factors that drive toward consolidation and control. Having created a prefect panopticon that maps every endpoint and every device on the network, and with the rise of middle-box collectors that use massive computing power to correlate identifiers, the end result will tilt toward command and control."

An expert in socio-technical systems wrote, "Social media tech firms will continue to resist control and meaningful regulation in order to preserve their core business, aptly described by Shoshana Zuboff as 'surveillance capitalism.' The oligarchs, perhaps still aided by foreign interests, will continue to manipulate public opinion for their own benefit. Economic inequality will continue to increase, as will resentment, misdirected toward immigrants and the 'elites.'"

An expert in human-computer design wrote, "The decay of democracy should be attributed foremost to capitalism itself, and thus only in a secondary way to technology. Capitalism seems overdue for major shock, enough so that predicting much of anything so far ahead as 2030 seems foolish. The present moment witnesses the close of a decade of ever-intensified distraction engineering."

An expert in the law who previously worked for a U.S. government agency wrote, "Increasingly sophisticated marketing based on data and inferred data on every individual threatens to cross the line between persuasion and manipulation and coercion, and the First Amendment restraints on government will require a substantial degree of proof of coercion before the government will be able to intervene to safeguard individuals from clear overreaching. The threat of manipulation – and we saw the first signs of that in 2018 with the Cambridge Analytica fiasco – is real and growing. Whether industry or government can curb it is an open question. Industry of course has a conflict of interest – the more successful its manipulation is, the more money industry makes. And government has the restraints of the First Amendment that limit its role."

J.M. Porup, a cybersecurity journalist, said, "Information technology disrupts democracy and redistributes power to the so-called intelligence community (a euphemism for the secret police). Mass surveillance makes possible totalitarian dictatorship with a thin veneer of Kabuki theater to make people think they still live in a free country. The impossibility of building perfectly secure software, networks or devices means that gangsters and spies (but I repeat myself) will hack those devices and seize control of them to accrue yet even more power. Cybersecurity is the central political question of our times, and political organization on the fifth domain [cyberspace as a venue for war, along with land, sea, air, space] looks a lot like martial law. Low-tech journalists reporting on these issues to low-tech audiences often confuse the issue. Major networks employ former spies to lie to the American people in what can only be called de facto state TV. The outlook is grim, and without more tech-savvy journalists to raise the alarm, I am pessimistic about the future of our political liberty. For more of my thoughts on this, see my book-length work in progress, '95ThesesofCyber.com.'"

Emilio Velis, executive director, Appropedia Foundation, said, "The way user participation has been shaped by technological platforms for the past 10 years turned the power of decentralized information back to the big corporations, platforms and stakeholders. Or, even worse, it has weakened the capacity of individuals of action while maintaining a false perception that they have control."

Peter Lunenfeld, professor of design, media arts and digital humanities, University of California-Los Angeles, and author of "Tales of the Computer as Culture Machine," wrote, "Commercial platform-driven communication technologies like Facebook, Twitter and their eventual successors are unlikely to strengthen representative democracy in the coming decades of the 21st century. They may add 'voices' to the conversation, but they will be unlikely to support and sustain the 20th century's dominant forms of successful democracies – those that designated representatives to debate and legislate on their behalf, from coherent parties that had established ideologies and platforms. What we are starting to see is the development of dialoguing 'communities' that mimic the give and take of true democratic action without offering actual power to its participants, like the Italian Five Star Movement, or the emergence of personality-driven, single-issue pop-ups like Nigel Farage's Brexit Party. Like Five Star and the Brexit Party, future political movements will use social media to offer the affordances of democratic dialogue without actually empowering participants to control or direct the movements. Social media technologies are creating skeuomorphs of democracies; they will have design attributes that look and feel democratic, but they will be authoritarian to the core."

An anonymous respondent commented, "The degree of tracking of comments by individuals will increase dramatically in the future as DeepMind-style algorithms are applied to internet-based material. It will become much harder for people to make comments without knowing that their attitudes are being logged and accumulated by organisations of all manner, so there will be a reluctance to speak one's mind. Hence 'free speech' will be constrained and thus the democratic process hindered."

A distinguished professor of electrical engineering and computer science who is an expert in the future of communications networks at a U.S. university wrote, "Social media makes it possible to reach voters in targeted ways and deliver information from a distance that is tailored to specific goals, rather than fostering local community discussion and participation. The lack of privacy in internet service platforms, along with artificial intelligence and big data, now make it possible for candidates to identify and influence voters in ways that could not have been imagined only a few years ago. Without corrective action (such as new election rules limiting the use of private citizen information), these new capabilities could lead to increased political instability and

possibly the breakdown of entire democratic systems. The U.S. appears to be the first such casualty in the Western world."

Sam Adams, a 24-year veteran of IBM now working as a senior research scientist in artificial intelligence for RTI International, architecting national-scale knowledge graphs for global good, said, "The internet provides a global megaphone to everyone in that anyone can publish their opinions and views instantly and essentially for free. The problem with everyone having a megaphone is that we get drowned in more noise than useful information. This is even more problematic since interest groups from all sides have used their power and resources to amplify their own voices far above the average citizen, even to the point of effectively silencing the average citizen by burying their smaller voice under a landslide of blaring voices controlled by wealthy interest groups. Given the interest-driven news cycles and echo chambers of social media, only the loudest or most extreme voices get repeated. This further exacerbates the level of emotion in the public discussion and drives listeners to the extremes instead of more common ground. A democracy must fairly represent its people's views if it is to succeed. And part of that fairness in this technology-dominant world must include balancing the volume of the voices."

Philip Rhoades, a business futurist and consultant based in Australia, wrote, "The neoliberal, developed Western world is sliding into fascism as the world's sixth mass extinction reaches its inevitable conclusion. As this ecological collapse and political regression proceeds, modern technology will mostly be used for suppression of the great majority of people/citizens. Some technology may help defend the populations against state suppression and terror, but its effectiveness will be minor in the greater scheme of things."

David Noelle, professor and researcher into computational cognitive neuroscience, University of California-Merced, wrote, "In the U.S., policy and public opinion have been increasingly shaped so as to support powered interests rather than the interests of the people. Regulation is dismissed as a threat to our troubled economy, encouraging corporate powers to pursue dangerous short-sighted strategies for producing return for investors. The unrepresented have been all but muted by electoral processes designed to sustain those in power. The most influential technologies of our times have been designed to depend on large centralized infrastructure. Data drives many new innovations, and few are in a position to collect and aggregate extensive data on the people. The focus on technologies that depend on controllable infrastructure, whether privately held or manipulated by political powers, will strengthen the positions of those currently in power, increasingly limiting the ability of the people to demand democratic representation. Note that this opinion is not intended as a call to limit technology but as a cry to radically alter political and economic institutions so as to provide representation to all of the people. A more democratic system will produce more democratic technologies."

Deirdre Williams, an independent internet activist based in the Caribbean, commented, "We are being taught that convenience is the most important priority. 'Innovation' is killing ingenuity. I would expect that over the next 10 years the pendulum will swing in the opposite direction, but it will take a while to repair the divide that has been (deliberately?) introduced between citizen and government, and to remind governments of their duty of care to all of the citizens."

Giacomo Mazzone, head of institutional relations, European Broadcasting Union and Eurovision, wrote, "I don't believe that internet platforms will be able to self-reform, despite all announcements and efforts shown. And so only a break-up solution or 'publicization' of the internet giants could change the future. The amount of power that has been transferred by citizens and by states to these actors that are not accountable to anybody (even to the U.S. government) is too big to think that they could renounce voluntarily. Do you remember 'Sliding Doors' – the 1998 movie with Gwyneth Paltrow as leading actor? The future could (in a 50/50 chance) go totally wrong or fantastically well. A digital interconnected society based on trust and respect of individual and human rights could be the next arcadia. A digital interconnected and mass-surveillance-oriented society based on exploitation of human weakness and on polarization of society could be the perfect implementation of the Orwell dystopia of '1984.' The two futures are equally possible. It's up to government and civil society to decide in which direction we shall go."

Scott B. MacDonald, an experienced chief economist and international economic adviser, said, "The future has a very real potential to be a dark Orwellian place, transfixed between strong technology under the control of a few wealthy and powerful and the great unwashed masses made economically redundant by machines and waiting for their daily dose of Soylent Green. One big change is that people may no longer have to go and vote but vote from hand-held or implanted communications devices. If we are not careful technology will be a device for greater control, not democracy, much as in China. Facial recognition anyone?"

Estee Beck, author of "A Theory of Persuasive Computer Algorithms for Rhetorical Code Studies," commented, "Unless Congress takes action and passes protective consumer legislation to limit private industry powers with technological growth, i.e., surveillance and privacy erosion, democratic institutions will face greater dangers from domestic and foreign threats, loss of trust among the American public and devaluation of private technological companies among the marketplace. The infrastructure of technology, with faulty programming that allows for penetration and deep hacks, the decisions made now with select leaders in technology companies driving pro-China surveillance growth, anti-U.S. and Mexico relations via border surveillance, marketing of biosecurity technologies and the eventual promotion of artificial intelligence consumer goods and services will divide the faith of the nation and leave the American public ill-trusting of Congress to take action for the public good."

Matt Colborn, a freelance writer and futurist based in Europe, said, "I do not deny the potential for technology to strengthen or even revolutionise democracy. In fact, this is what I hoped for at the beginning of the revolution in the 1990s. However, from a citizen perspective, the new technology seems to me to have already reduced mental autonomy and the capacity for intelligent choice. Why? 1) Platforms like YouTube seem to be more appropriate for distributing propaganda and for involuntary brainwashing because of the algorithms used. 2) Extreme tribalism has also increased because of the 'echo chamber' nature of personalised media. 3) Government and corporations are demolishing any kind of privacy. Neurotech, where thoughts are read, is the 'final frontier' of this. The problem, too, is the toxic interaction between archaic authoritarian institutions, right-wing populism and new tech. These effects mean that democracy is diluted whilst a 'surveillance' state is strengthened and while deep tribal divisions are exacerbated. Although there are certainly counter movements to this, economic inequality is such that basically the rich and powerful are in a position to cash in on these developments and the rest of us are not. Those who want political innovation will find it tough in this environment."

An artificial intelligence expert predicted, "'Democracy' is likely to be even more of an elitist endeavor by 2030 than it is now. Life is good if you're a big corporation, but not if you're an ordinary working-class citizen. Who has a voice in this world will depend even more on money and power. Civic technologists will first promise to save democracy with technology but then start charging for it after five years because 'someone has to pay for maintenance.' And they will get away with it, because no one will remember that political rights are a basic right and not a commodity."

An anonymous respondent wrote, "Recently Hong Kong protesters had to buy single-trip transit cards with cash to be able to exercise democratic power; this will be impossible when mass face-recognition technology is implemented. Essentially, it is becoming almost impossible to behave democratically."

Anonymous respondents commented:

- "Technology is going to aggregate people's individual voices and remove individual democracy."
- "Democratic regimes could become less democratic from the misuse of surveillance systems with the justification of national security."
- "I am sadly confident that democratic institutions will not be affected in any positive way in future by citizen's perspectives; instead, technology will continue to create disenfranchised, disempowered citizens."

Exploiting digital illiteracy: Many people's lack of digital fluency and apathy make for an ill-informed and/or dispassionate public, weakening democracy and the fabric of society

James S. O'Rourke IV, a University of Notre Dame professor whose research specialty is reputation management, said, "As Neil Postman wrote in 1985, 'We no longer engage in civil public discourse. We are simply amusing ourselves to death.' Among the more insidious effects of digital life has been a reduction in tolerance for long-form text. People, particularly the young, will read, but not if it involves more than a few paragraphs. Few among them will buy and read a book. News sites have discovered that more people will click on the video than scroll through the text of a story. Given how easy it now is to manipulate digital video images, given how easy it is to play to people's preconceptions and prejudice, and given how indolent most in our society have become in seeking out news, opinion and analysis, those who seek to deceive, distract or bully now have the upper hand. Jesuits have long cautioned that 'No man can understand his own argument until he has visited the position of a man who disagrees.' Such visits are increasingly rare. The long-predicted 'filter bubble' effect is increasingly visible. People will simply not seek out, read or take time to understand positions they do not understand or do not agree with. A sizeable majority now live with a thin collection of facts, distorted information and an insufficient cognitive base from which to make a thoughtful decision. Accurate information is no longer driving out false ideas, propaganda, innuendo or deceit."

Bernie Hogan, senior research fellow, Oxford Internet Institute, said, "Technology without civics is capitalism with crystallised logic and unbounded scope. Democratic institutions and civic societies are premised on boundaries and intelligible scales, like the 'local paper' or the 'provincial radio.' Technology is allowing for the transcendence of scale, which we might think is great. Certainly, from a logistics and delivery side it is very impressive. But social cohesion requires levels of understanding that there's a coherent bounded population to care about and define one's identity through and against. It requires people seeing and doing things as more than consumers and occasional partisan voters."

Larry Rosen, a professor emeritus of psychology at California State University-Dominguez Hills, known as an international expert on the psychology of technology, wrote, "I worry that many in the public will and do not have the skills to determine truth from fiction, and twisted truth can and does lead to misunderstanding the content."

Carolyn Heinrich, professor of education and public policy at Vanderbilt University, said, "As internet content is increasingly customized for us by who we know and where we click, the range of information and perspectives we are exposed to will narrow unless we make the effort to read

more widely ourselves. To minimize the negative effects, we have to proactively make the effort to broaden our circles of communication and sources of information/knowledge. As technology increasingly pervades our K-12 school curricula, we also need to examine exactly what technology vendors are conveying in their content, and who is the 'face' of that content in instructional videos. That is something we are currently investigating in our research."

Cliff Zukin, professor of public policy and political science, Rutgers University, responded, "In the U.S. anyway, increasing political apathy has accompanied increasing use of technology. It has, on the one hand, been diversional from attention to matters of governance and citizenship. On the other, the centrifugal forces of interests made more available by increasing technology has eroded the core knowledge base of citizens, as well as the norms of citizenship. It does allow for mass movements to organize more quickly and put pressure on leaders, but the right-wing, post-recession populism and withdrawal from globalism is not, in my judgment, a good thing."

An anonymous respondent said, "Unfortunately, fundamentally undemocratic processes in the United States, like the electoral college, will continue to be undermined by fake news and technology-backed manipulation of rural states, which have outsized electoral college voting power but typically lack education and will likely remain vulnerable to such exploits."

A fellow at a major university's center for internet and society wrote, "I am worried that the ease with which hostile powers and trolls can manipulate public opinion will only increase and become more sophisticated, leading to voters having increasingly lower levels of factual information at their disposal or, worse yet, increasing apathy toward or cynicism about voting and the democratic process entirely."

Eric Royer, assistant professor of political science, Saint Louis University, said, "The breakdown of norms creates an environment of false truths that is directly tied to political polarization, especially among the fringes, and citizen mistrust and apathy with anything 'government.' Technology, especially in social media platforms, holds unlimited potential to make the world less of an unfamiliar place, however, its manipulation and influence in our daily lives is truly misunderstood at the current expense of democratic processes and institutions globally and domestically."

A research scientist focused on fairness, transparency and accountability in artificial intelligence said, "The rise of fake news and manipulated media like deepfakes has sown a greater distrust of media and institutions that is undermining democracy, leading to a less-informed and less civically engaged population. People don't know what to believe, so they often choose either to believe nothing or to believe whatever their gut tells them. Moreover, foreign

actors that use social media manipulation tactics to sway elections further undermine democracy's legitimacy."

Mark Andrejevic, associate professor of communications, University of Iowa, wrote, "Much of my career has been built around my profound concerns about the impact that technology is having on democratic processes of deliberation, public accountability and representation. This is because technology needs to be understood within the context of the social relations within which it is deployed, and these have been conducive to privileging an abstract consumerist individualism that suppresses the underlying commitment to a sense of common, shared or overlapping interests necessary to participation in democratic society. I see the forms of hyper-customization and targeting that characterize our contemporary information environment (and our devices and mode of information 'consumption') as fitting within a broader pattern of the systematic dismantling of social and political institutions (including public education, labor unions and social services) that build upon and help reproduce an understanding of interdependence that make the individual freedoms we treasure possible. Like many, I share concerns about rising political polarization and the way this feeds upon the weaponization of false and misleading information via automated curation systems that privilege commercial over civic imperatives. These trends predate the rise of social media and would not have the purchase they do without the underlying forms of social and civic de-skilling that result from the offloading of inherently social functions and practices onto automated systems in ways that allow us to suppress and misrecognize underlying forms of interdependence, commonality and public good. I am not optimistic that anything short of a social/political/economic disaster will divert our course."

Carlos Afonso, an internet pioneer and digital rights leader based in Rio de Janeiro, Brazil, wrote, "Thinking here of a planet with 7 billion-plus persons, most of them (including many of the supposedly 'connected') are unable to discern the many aspects of disinformation that reaches them through traditional (entrepreneurial) media, social networking apps and local political influences."

A longtime CEO and internet and telecommunications expert commented, "Citizens will increasingly act absent of any understanding of critical analysis and reasoning, fact-checking or even rule of law. Under the guise of 'acting out against injustice' we will continue to see cyber vigilantism, whereby social media firestorms effectively 'try and convict' anyone accused of word or deed not supportive of their values."

Gretchen Steenstra, a technology consultant for associations and nonprofit organizations, wrote, "I am concerned about higher velocity of information that does not include all critical and supporting information. Data is used to inform one view without context. Consumers do not fact-

check (on many issues regardless of party). Americans are not focused on social responsibility or downstream impacts – they only want instant results. Continuous media weakens people's ability to seek information and form their own opinion. Constant connectedness prevents reflection and allows your brain to relax. No one can argue with the desire for understanding."

A fellow at a think tank's center for technology and innovation wrote, "Democracy will be driven by more artificial intelligence systems, which will automate a range of decisions. Consequently, individuals may have limited input into their own decisions because data will be extrapolated from machines. What this will mean is a looser connection to democratic processes or connections driven by what one sees, hears and senses through dominant platforms. Without some level of policy restraint when it comes to specific use cases, such as voting, technology may serve to erode public trust, while simultaneously relying less on actual public input due to the level of sophistication that emerging technologies offer."

Ayden Férdeline, technology policy fellow, Mozilla Foundation, responded, "Technology will continue to be exploited by those who seek to increase political apathy and undermine our trust in established institutions. This may happen more subtly than in the past, but the corrosive effect on democracy will be just the same."

Philip J. Salem, professor emeritus, Texas State University, expert in complexity of organizational change, said, "People will become increasingly more careful about how they use the internet. Each person must be more mindful of use. My concern is that reflexive, non-mindful reactions can spread so fast and have more tragic consequences with the speed of the internet."

Jeff Johnson, a professor of computer science, University of San Francisco, who previously worked at Xerox, HP Labs and Sun Microsystems, said, "Today's social media encourages the spread of unverified information, which can skew policymaking and elections. People tend to be lazy and do not even read most of the articles they comment on, much less check the truth of the articles. In the TV era, before social media, putting out false information about a political opponent or ballot measure was expensive and subject to laws against 'false advertising.' Political hit pieces had to be well-funded, vaguely worded and carefully timed (to just before the election) in order to sway elections. That is no longer true. Strong regulation of social media could perhaps mitigate this, but such regulation seems unlikely in the foreseeable future."

Pamela McCorduck, writer, consultant and author of several books, including "Machines Who Think," said, "I am not sanguine about democracy right now. The internet amplifies trends that have been with us for a while – extremism and apathy. Our proportion of potential voters who actually vote only rose once or twice in the past few elections. Mostly it is dismal. Partly this is a

result of voter suppression (not just removing voters from the rolls, but also making the process of voting far more cumbersome than it needs to be). Partly this is the realization by voters that elected officials are more beholden to dark money than to the people who elected them. I hope I am wrong about the future of this country I love."

Luis German Rodriguez, researcher and consultant on knowledge society and sociotechnical impact based at Universidad Central de Venezuela, commented, "Democracy is likely to be weakened by 2030. … Authoritarian rule seems to be growing stronger wherever you look, supported by the emerging technologies."

Anonymous respondents commented:

- "People will not use the internet to research the issue, rather, they will simply go with whatever biased opinion is put in front of them."
- "The problem is that with the erosion of critical-thinking skills, true journalism versus opinion journalism (and the prevalence of 'sound bites' in lieu of serious debate based on facts) lack of proper policy and governance principles, these tools are being used to spread false information."
- "The public made more gullible by a short attention spans, eroding reasoning skills, becomes a malleable target for those who seek to erode the fundamental institutions of our democracy."
- "I'm less concerned about technology than I am the ability and willingness of my fellow citizens to educate themselves about the sources of information they consult."
- "The biggest threat to democracy is people's lack of critical-thinking skills to be able to distinguish between information and misinformation."

Waging info-wars: Technology can be weaponized by anyone, anywhere, anytime to target vulnerable populations and engineer elections

Richard Bennett, founder of the High-Tech Forum and ethernet and Wi-Fi standards co-creator, wrote, "The economic model of social media platforms makes it inevitable that these tools will do more harm than good. As long as spreading outrage and false information generates more profits than dealing in facts, reason, science and evidence, the bad guys will continue to win. Until we devise a model where doing the right thing is more profitable than exploiting the public's ignorance, the good guys will keep losing. … One hypothetical change that I would like to see would be the emergence of social media platforms that moderate less for tone and emotion and more for adherence to standards of truthfulness and evidence. Making this approach succeed financially is the major obstacle."

Mutale Nkonde, adviser on artificial intelligence at Data & Society and fellow at Harvard's Berkman Klein Center for Internet and Society, wrote, "Without significant regulation, our future elections will be ruled by the parties that can optimize social media recommendation algorithms most effectively. In the present moment, those are parties like Cambridge Analytica who used fear, racism and xenophobia to influence elections across the world."

Eduardo Villaneuva-Mansilla, associate professor of communications at Pontificia Universidad Catolica, Peru, and editor of the Journal of Community Informatics, said, "The lack of agreement about how to deal with these issues among governments is a serious threat to democracy, as much as the potential for misuse of technological innovations. In the next decade, the complete control by a few multinational firms will be completely outside of regulatory and policy reach of developing countries' governments. This will increase the instability that has been normalized as a feature of governance in these countries."

An expert in the ethics of autonomous systems based in Europe said, "Digital devices provide more and more new means to enhance the power of leaders to control people and to manipulate an inferior substitute for democracy to their benefit. They simulate and broadcast false flavours of democratic representations to the population. Decisions that restrict people's rights, autonomy and freedom are promoted as necessary for enhancing the security, care and well-being of the population, while in fact the purpose is to protect the interests of those who seek power and influence. New digital means (biometrics, facial recognition, big data, deep learning, artificial intelligence) allow those in power to recognize and to profile people (position, behavior, location, ways of thinking, ideas, political opinions, level of life, health, origins, money, social relationships and so on). Stakeholders can use these devices to make appropriate decisions concerning what they consider subversive people and moreover to fight them if necessary. Robots and autonomous AI systems will be very efficient slaves to help to educate people who will not fit the requirements and rules imposed by the dominant class. This model will be developed in more and more states in the world and will progressively narrow freedom and decrease the quality of life of ordinary people belonging to medium and low social classes. At the same time, the field of available jobs will be more and more narrow because AI and robots will replace human beings in most areas and lead the majority of people to be unable to find means to work to support and fulfill themselves."

Larry Masinter, internet pioneer, formerly with Adobe, ATT Labs, Xerox PARC, who helped create internet and web standards with IETF and W3C, said, "Traditional democracy and democratic institutions rely on geographically defined boundaries for constituencies. Enabling technology will accelerate the rise of cross-jurisdictional malfeasance, whether it's called collusion or something else."

An anonymous respondent warned, "Authoritarians will weaken checks and balances, turn courts into extensions of those in power and thus undermine representative democracy – enabled by the manipulation of digital media to stoke fear and mask inconvenient truths. … Extreme partisanship is putting all of our democratic institutions at risk to the point that shared power and orderly transitions may not exist in 10 years. Civil unrest seems inevitable."

Rich Salz, senior architect, Akamai Technologies, wrote, "Individual citizens cannot stand up to the organized 'power' of other countries. This is not like armed revolution; this is small numbers of employees able to affect what thousands, if not millions, see."

Heywood Sloan, entrepreneur and banking and securities consultant, said, "The current U.S. administration is leading the way to misuse technology. It permeates the public air with disinformation and lies, while putting a heavy hand on the scale in the background. It welcomes trolls to conferences in the White House and encourages them. Even if the administration changes it will take time and work to undo the damage. Media technology corporations have lost control of their platforms and marketing staffs – witness Facebook and Cambridge Analytica. Already we have rogue state sponsors altering our dialogues, yet we ignore them and chortle away with their leaders."

An associate dean of research for science and engineering said, "Over the next 10 years, we will see an increase in the current trend of using technology to further engineer elections (including gerrymandering) and to target those most vulnerable to manipulation (on all political sides). A result is overrepresentation in elected government of self-interested minority points of view (extremes on many sides), increased obstacles to ousting parties from power (especially in two-party systems like the U.S.), and, for a while at least, the continued divisiveness of political discourse."

A consultant who works for U.S. government agencies said, "The biggest fear of technology will be the use of artificial intelligence. While at present we have control of AI, in time we will lose that control. As systems are augmented with AI, it will remove the human element over time. We can say what we like about technology and our control of technology, but in time external forces will replace the human element. This will happen in all areas of technology, including the governmental technology world. At some point it will go beyond its own programing doing what it believes is in our best interest."

Sowing confusion: Tech-borne reality distortion is crushing the already-shaky public trust in the institutions of democracy

The leader of a technology innovation group at one of the world's top five technology organizations wrote, "Technology has already and will continue to place huge strains on democracy. First, digital technology makes it immensely easy for a small number of leveraged actors to exercise great control over our public discourse. We see this as they exercise control over the information made available and presented to citizens. Second, digital technology makes it immensely easy for actors to hide or obscure their involvement and their intent. Third, digital technology makes it immensely easy to erode truth through fabrications or amplifications."

Nigel Cameron, president emeritus, Center for Policy on Emerging Technologies, said, "I fear deepening distortions in public perception by the leveraging of digital media on the part of governments (our own and foreign), tech corporations and other actors – as new technologies like fake video make it even easier to shape opinion. It will be some time before (assuming it happens) we have the will and the tech to rein in these abuses. As things stand, partisanship by politicians and the 'sorry, not sorry' approach of Mark Zuckerberg and the other tech leaders portend deepening problems."

Richard Forno, assistant director, Center for Cybersecurity at the University of Maryland-Baltimore County, wrote, "[Technology] will weaken democracy; it will continue to reinforce echo chambers that disallow acknowledgment of, let alone tolerance of, alternative views, new discoveries, facts and/or realities. This will contribute to further tribalism among citizens and also be reflected in the views/actions of their elected officials."

Alejandro Pisanty, professor at UNAM, the National University of Mexico, and an activist in multistakeholder internet governance, wrote, "Hate, polarization, oversimplification and lack of well-considered thought are and will be on the increase. They are orders of magnitude easier to construct and propagate than the ways of countering them (the 'bullshit asymmetry' principle, on steroids). Manipulation of elections and other processes will continue to be rife as long as there exist those who want to do it and those susceptible to manipulation. Among the hardest hit will be the U.S., which has a gullible population unable to see the meta-layers of attack they are subjected to. There is hope for improvement in a smaller, smarter, more-democratic sector of society fighting the acritical reactions of the naive and uneducated. Better information, resilient systems (by design) and deliberations nested at all levels from the ultra-local to the global, an architecture of multistakeholder deliberations and decisions, and a lot of luck, may lead to improvement. Otherwise splintering and other forms of dark days loom."

Rich Ling, professor, Nanyang Technological University, Singapore; expert on the social consequences of mobile communication, said, "The forces that want to confuse/undercut legitimate information are learning how to best use these systems. They are also learning how to

calibrate the messages they send so as to enhance their divisiveness. This division plays on confirmation bias and, in turn, undercuts the common ground that is needed for effective governing and democracy."

Karl Auerbach, chief technology officer, InterWorking Labs, active in internet design since the early 1970s, had less faith in multistakeholder organizations, writing, "Democracy is dying at the hands of a concept called 'stakeholder.' This has little to do with technology except that people are being led to believe that they are not skilled enough or smart enough to decide for themselves, that technological experts ought to decide on their behalf. We are moving toward not improved democracy (direct or indirect) but closer to an oligarchy of 'stakeholders.'"

Glyn Moody, a prolific technology journalist, blogger and speaker based in Europe, said, "Lies propagate more easily than truth. It is proving far easier to use the latest technology to undermine the things we thought were safe and stable. It is proving very hard to counter that abuse of technology."

A computing science professor emeritus from a top U.S. technological university wrote, "As artificial intelligence technologies are employed to create ever-more-realistic disinformation videos and as multiplication of software AI disinformation bots can be replicated and spread easily by individuals or small groups, more and more people will be fooled by disinformation, thus weakening our democracy."

A professor of sociology at a major California university said, "Powerful governments and their allies are using technology to destroy the concept of a single, accepted truth. While not always succeeding in implanting particular beliefs in the minds of citizens and residents, the constant assault on truth leads to fatigue and resignation, that the actual truth cannot be known, or that all political actors are equally bad. This resignation, moving into apathy, allows those in power to behave badly and centralize their power. The wild card is whether new technologies can detect bots and fake video/audio, and whether mainstream media and social media companies behave responsibly to bring an accepted truth back to life."

Alan Honick, project director for PROSOCIAL, said, "My work is focused on the need to make the internet and associated information technologies trustworthy and reliable. … The most important variable for the question at hand is whether or not information technology can move in the direction of becoming a trusted and reliable source of information, and at present the trend seems to indicate not."

Annemarie Bridy, professor of law specializing in the impact of new technologies on existing legal frameworks, said, "Social media platforms have a steep hill to climb over the coming years when it comes to dealing effectively with disinformation and coordinated inauthentic behavior aimed at manipulating voters and electoral outcomes. Viral disinformation online will continue to be a serious threat to democratic institutions and the integrity of elections."

Garth Graham, a longtime leader of Telecommunities Canada, said, "The digital age is characterised by a disintermediation of authority. Authority as a principle for structural organization is disappearing. Democracy is predicated by the agreement to accept authority to represent. Most people are no longer willing to accept that anyone else can represent them."

Stephanie Fierman, partner, Futureproof Strategies, said, "Many parties have an incentive to issue false and damaging statements and content that people believe. Until we return to a world in which a fact is a fact is a fact, we will see a continuing degradation of truth and the existence of checks and balances, both of which being so vital to the presence of democracy."

Stuart Umpleby, retired professor of management and director of research at George Washington University, commented, "The operators of social media platforms, such as Facebook, need to take responsibility for content. Otherwise they benefit by distributing falsehoods."

Satish Babu, founding director of the International Centre for Free and Open Source Software, said, "If the world does not recognize the pitfalls and take corrective action, technology is likely to adversely impact the quality and practice of democracy. In particular, the pragmatics of democracy will deteriorate into an 'anything goes,' free-for-all fight where artificial intelligence will be used to dig up or magnify or even create antecedents of candidates from historical records and social media will be used to push such 'facts' to every citizen."

A professor of sociology and public policy wrote, "Bot armies and databases of persuadable people that include information on what sets them off empower the worst nationalistic and international actors to tear down democracies. Via technology, people can enter alternate realities where others reinforce their fantasies and strengthen them – flat earthers, those who believe in vaccine and climate conspiracies, moon landing hoaxers and so forth. These are problematic in their own right, but also lend themselves to further manipulation, destruction of trust in institutions, scapegoat seeking, and the rejection of science."

Filippo Menczer, a grantee in the Knight Foundation's Democracy Project and professor of informatics and computer science at Indiana University, said, "Technology … mediates our access to information and opinions. This will in part strengthen democracy, for example making it easier

to check facts. It will also weaken democracy, as vulnerabilities due to the interplay of cognitive, social and algorithmic biases continue to be exploited and new ones are discovered. On balance, my prediction is that things will get worse before they get better. We are only just beginning discussions about the legal implications of countermeasures, for example the issues related to social bots, disinformation campaigns, suppression of speech and the First Amendment in the U.S."

Nancy Heltman, manager of a state agency based in the U.S., wrote, "The negative aspects of bots and influencers driving opinions are likely to outweigh the positive aspects of increasing involvement in the political process."

David Gans, musician, songwriter and journalist, said, "I fear that deliberate falsehoods will continue to crowd objective reality out of the discourse. The social networks seem neither able nor particularly willing to intervene on behalf of the truth, and there are powerful and well-funded entities with a strong interest in misinforming the public."

A research leader for a U.S. federal agency said, "Working to be respectful of First Amendment rights while not allowing the perpetuation of mis- or disinformation is of critical concern. I don't expect that to be resolved within the next 10 years. We are living in the times of 50 shades of gray. In many cases, the determination is not black and white. The headline may be misleading, but not entirely untrue. I think that's appealing to the media right now."

Kenneth R. Fleischmann, associate professor at the School of Information at the University of Texas-Austin, wrote, "Technology will have complex effects on society that will be difficult to predict, that depend on the decisions of tech companies, governments, the press and citizens. … Trust will be key, not just blind trust, but trust based on transparent provenance of information that can help users exercise their autonomy and agency."

Anonymous respondents commented:

- "Technology will weaken our ability to come to consensus; by nurturing smaller communities and fringe ideas, it will make compromise and finding a *modus vivendi* much more difficult."
- "Social media will continue to erode faith in facts and reason; echo chambers and emotion-driven communications plus security problems in voting will undermine public discourse and faith in elections."
- "There seems to be no realistic way to check the effects of IT on polarization and misinformation. The true beliefs and actions of political leaders will continue to have decreasing influence on voting."

- "Foreign countries and hate groups will grow more sophisticated in their ability to infiltrate the web with biased stories and ads designed to suppress or sway voters and negatively impact public opinion."
- "While it enables voices to be heard, tech has already weakened democracy by enabling governments and corporations to erode privacy and silence those who might otherwise speak out."
- "We don't need mass armies anymore. New technology enables centralized control to a degree never imagined before."
- "In 2030, there will still be splintering and increased political polarization as individuals are able to challenge democratic ideals and influence political processes through anonymous activities."
- "Democracy is, and will always be, filled with fake news and preposterous bloviation."

Weakening journalism: There seems to be no solution for problems caused by the rise of social media-abetted tribalism and the decline of trusted, independent journalism

Christopher Mondini, vice president of business engagement for ICANN, commented, "The decline of independent journalism and critical thinking and research skills resulting from easy reliance on the internet make citizens more susceptible to manipulation and demagoguery. A growing proportion of politically active citizens are digital natives with no recollection of life before social media became the primary medium for debate and influence. The pursuit of clicks, retweets and page views encourages extremist or provocative rhetoric. Viral memes and soundbites distract from thoughtful analysis, deliberation and debate. Of course, the vast majority of citizens are not politically active, but they increasingly consume news and adopt a worldview shaped by their online communities. Participation in political processes may rise because of newly inflamed passions brought about by online discourse, but they may crowd out more measured voices."

Yaakov J. Stein, CTO, RAD Data Communications, based in Israel, responded, "Social media as they are at present have a polarizing effect that destabilizes democracy. The reason is that advertising (and disinformation) is targeted at and tailored to people according to their preexisting views (as predicted based on their social media behavior). This strengthens these preexisting views, reinforces disparagement of those with opposing views and weakens the possibility of being exposed to opposing views. The result is that free press no longer encourages democracy by enabling people to select from a marketplace of ideas. Instead the right to free press is being used to protect the distribution of disinformation and being manipulated to ensure that people are not

exposed to the full spectrum of viewpoints. Perhaps an even more insidious result is that people attempting to keep open minds can no longer trust information being offered online, but that free information online has led to the bankruptcy of traditional news outlets that spend resources on fact-checking."

Rey Junco, director of research at CIRCLE in the Tisch College of Civic Life, Tufts University, said, "We can expect that attempts to influence public perceptions of candidates and elections are not only ongoing, but that they will continue to be successful. Technology use by citizens, civil society and governments will first weaken core aspects of democracy and democratic representation before there is a restructuring of technological systems and processes that will then help strengthen core aspects of democracy. There are two issues at play: 1) Ideological self-sorting in online spaces that is bolstered by algorithmic polarization and 2) The relative unwillingness of technology companies to address misinformation on their platforms. Individuals who get their news online (a larger proportion who are young – Pew Research) choose media outlets that are ideologically similar and rarely read news from the opposing side (Flaxman, Goel, & Rao, 2018). In fact, these individuals are rarely exposed to moderate viewpoints (Flaxman, Goel, & Rao, 2018). Social media, in turn, allow for not just informational self-sorting as with online news, but such self-sorting is bolstered through algorithmic curation of feeds that promotes ideological separation. … Although major technology companies are aware of how misinformation was promoted and propagated through their networks during the 2016 elections and resultant congressional hearings on the topic, little has been done to mitigate the impact of such deliberate spreading of misinformation. Analyses from the security and intelligence communities show that state actors continue their attempts to manipulate public sentiment in social spaces, while the increased polarization of traditional outlets has minimized the impact of these reports. State actors are emboldened by the fact that the United States has not addressed the spread of misinformation through technological change or through public education."

An associate professor of computer science who previously worked with Microsoft, said, "I worry about three related trends: 1) the increasing decentralization of news generation, 2) the lack of easy-to-use, citizen-facing mechanisms for determining the validity of digital media objects like videos and 3) personalization ecosystems that increase the tendency toward confirmation bias and intellectual narrowing. All three trends decrease the number of informed voters and increase social division. Governments will eventually become less averse to regulating platforms for news generation and news dissemination, but a key challenge for the government will be attracting top tech talent; currently, that talent is mostly lured to industry due to higher salaries and the perception of more interesting work. Increasing the number of technologists in government (both as civil servants and as politicians) is crucial for enabling the government to proactively address the negative societal impacts of technology."

Kenneth Sherrill, professor emeritus of political science, Hunter College, said, "When I'm pessimistic, I believe that the fragmentation of information sources will interact with selective attention – the tendency only to follow news sources that one expects to agree with. This will generate even greater polarization without any of the moderating effects and respect for democratic processes that come from genuine participation. This can lead to the collapse of democratic processes. Right now, I'm pessimistic. The 2020 election may be the test."

Eric Keller, lecturer in international relations and U.S. foreign policy, University of Tennessee-Knoxville, wrote, "Social media will heighten the current strong polarization that we already have. This is mainly from 'information stovepipes' and mutually reinforcing narratives that demonize the opposition. This creates the danger of democratic institutions being degraded in the name of 'saving' them from the opposing political party."

A Europe-based internet governance advocate and activist said, "If current trends continue, there won't be a real democracy in most countries by 2030. The internet's funding model based on targeted advertising is destroying investigative journalism and serious reporting. More and more of what is published is fake news. Citizens cannot make informed decisions in the absence of reliable information."

The coordinator of a public-good program in Bulgaria wrote, "By 2030 we will still see fighting between small groups and communities that leads to extremes. This will give ground to governments to become more authoritative and build up even stronger control via the internet."

Bill D. Herman, researcher working at the intersection of human rights and technology said, "The combination of news fragmentation, systematic disinformation and motivated reasoning will continue to spiral outward. We're headed for a civil war, and the hydra-headed right-wing hate machine is the root of the problem."

An internet pioneer and technology developer and administrator said, "The foundation of democracy is an informed public. By undermining the economic foundation of journalism and enabling the distribution of disinformation on a mass scale, social media has unleashed an unprecedented assault on the foundation of democracy. The decline of newspapers, to just highlight one downside, has had a quantifiable effect (as measured in bond prices) on governmental oversight and investor trust."

A professor and expert in learning in 3D environments said, "The explosion in the volume of information has led to the majority of people tending to rely on or trust the major platforms to filter and distribute information rather than managing their own personal learning environments

with feeds from trusted independent sources. … As the filtering mechanisms become more sophisticated and more personalized to the individual, the opportunities for the wealthy to manipulate opinion will become even greater. The democratic system depends fundamentally on free access to reliable information, and once this is gone the system will effectively become less and less democratic."

Mike Douglass, an independent developer, wrote, "Facebook sold people on the idea that a race to accumulate 'friends' was a good thing – then people paid attention to what those 'friends' said. As we now know, many of those 'friends' were bots or malicious actors. If we continue in this manner, then things can only get worse. We need to reestablish the real-life approach to gaining friends and acquaintances. Why should we pay any attention to people we don't know? Unfortunately, technology allows mis/disinformation to spread at an alarming rate."

Eric Goldman, professor and director of the High-Tech Law Institute at the Santa Clara University School of Law, commented, "Our politicians have embraced internet communications as a direct channel to lie to their constituents without the fact-checking of traditional media gatekeepers. So long as technology helps politicians lie without accountability, we have little hope of good governance."

Janet Salmons, consultant with Vision2Lead, said, "The internet, with unregulated power in the hands of commercial entities that have little sense of social responsibility, will continue to unravel Western-style democracies and civic institutions. Companies profiting from sales of personal data or on risky practices have little self-interest in promoting the kinds of digital and advanced literacy people need to discern between fact and fiction. In the U.S., the free press and educational systems that can potentially illuminate this distinction are under siege. As a result, even when presented with the opportunity to vote or otherwise inveigh on decision-making, they do so from weak and uninformed positions. The lowest common denominator, the mass views based on big data, win."

A researcher and teacher of digital literacies and technologies said, "In the early internet days, there was a claim it would bring a democratization of power. What we're seeing now is the powerful having larger and more overwhelming voices, taking up more of the space rather than less. This leads to polarization, rather than a free-flowing exchange of ideas. Anyone falling within the middle of a hot issue is declared a traitor by both sides of that issue and is shamed and/or pushed aside."

An anonymous respondent commented, "Increased engagement is largely a product of the media environment, and – in places where the press is absent, restricted or has become blatantly

politicized – that engagement will bear the marks of a distorted information environment."

Responding too slowly: The speed, scope and impact of the technologies of manipulation may be difficult to overcome as the pace of change accelerates

Kathleen M. Carley, director of the Center for Computational Analysis of Social and Organizational Systems at Carnegie Mellon University, said, "Disinformation and deepfakes in social media as well as the ability of individuals and media-propaganda teams to manipulate both who is and can communicate with whom and who and what they are talking about are undermining democratic principles and practice. Technological assistants such as bots, and information tools such as memes, are being used in ways that exploit features of the social media and web platforms, such as their prioritization rules, to get certain actors and information in front of people. Human cognitive biases, and our cognitive tendencies to view the world from a social or group perspective, are exploited by social media-based information maneuvers. The upshot is that traditional methods for recognizing disinformation no longer work. Strategies for mitigating disinformation campaigns as they play out across multiple media are not well understood. Global policies for 1) responding to disinformation and its creators, and 2) technical infrastructure that forces information to carry its provenance and robust scalable tools for detecting that an information campaign is underway, who is conducting it and why do not exist."

Jason Hong, professor of Human-Computer Interaction Institute, Carnegie-Mellon University, said, "Basically, it's 1) easier for small groups of people to cause lots of damage (e.g., disinformation, deepfakes), and 2) easier for those already in power to use these technologies than those who need to organize. In the early days of the internet, new technologies empowered new voices, which led to a lot of utopian views. However, we've seen in recent years that these same technologies are now being used to entrench those already in power. We see this in the form of targeted advertising (being used for highly targeted political campaigns), analytics (being used for gerrymandering), disinformation and fake news (being used both domestically and by foreign powers, both unintentionally and intentionally) and filter bubbles where people can seek out just the information that they want to hear. All of this was possible before the internet, but it was harder because of natural barriers. We also haven't seen the political effects of deepfakes and are just starting to see the effects of widespread surveillance by police forces."

Mark Raymond, assistant professor of international security, University of Oklahoma, wrote, "Over the next 30 years, democracy faces at least three kinds of technology-based risks. First, actual or apparent manipulation of voting data and systems by state actors will likely undermine trust in democratic processes. Second, social media manipulation (by states and by political

campaigns and other nonstate actors) will compound echo chamber effects and increase societal polarization. Decreased trust will heighten social conflict, including, but not limited to, conflict over elections. Third, 'deepfakes' will undermine confidence even in video-based media reports. Taken together, there is the risk that these trends could increase the willingness of voters to accept fundamentally authoritarian shifts in their politics. Absent that, it is still likely that increased polarization will make the operation of democratic systems (which are heavily dependent on mutual acceptance of informal norms) incredibly difficult."

Emmanuel Edet, legal adviser, National Information Technology Development Agency, Nigeria, said, "The core concepts of democracy, representation, elections and tenure of government will be greatly undermined by artificial intelligence. The use of social media coupled with faceless artificial intelligence-driven opinions can manipulate popular opinion that will deny people the right to express their choice for fear of going against the crowd."

Matt Moore, innovation manager at Disruptor's Handbook, Sydney, Australia, said, "The issue is not that essential democratic institutions will change, it is that they will not change enough. Elections, voting, representatives, parties – none of these things will go away. They may mean more or less (likely less) than they used to. The number of democracies in the world is likely to decrease as weak or destabilised states fall into authoritarian populism. Western democracies will continue to age and grow more economically unequal. States like China will continue to grow in power, often using new technologies to control their populations. Everyone is talking up the potential of blockchain for democracy. This is mostly nonsense. The issue is not that people do not have the opportunity to vote enough. It is that no one really knows what that vote means. Many of those who vote – or rather, who do not vote – have no sense of what their vote means. Many of those who are voted for, also do not know what that vote means – which is why they rely on polling and focus groups. Deliberative democracy offers a potential new form of political engagement and decision-making – if (and this is a big 'if') it can be made to work beyond isolated experiments."

Mike O'Connor, retired, a former member of the ICANN policy development community, said, "There is cause for hope – but it's such a fragile flower compared to the relative ease with which the negative forces prevail. 'A lie can get around the world while truth is getting its boots on' – pick your attribution."

A longtime technology journalist for a major U.S. news organization commented, "Our laws and Constitution are largely designed for a world that existed before the industrial age, not to mention the information age. These technologies have made the nation-state obsolete and we have not yet grasped the ways they facilitate antidemocratic forces."

Hume Winzar, associate professor and director of the business analytics undergraduate program at Macquarie University, Sydney, Australia, said, "Corporations and government have the information and the technology to create highly targeted messages designed to favour their own agendas. We, as citizens, have demonstrated that we rarely look beyond our regular news sources, and often use easily digested surrogates for news (comedy shows, social media). We also seem to have very short memories, so what was presented as a scandal only a year ago is usual, even laudable, now. … None of this is new. The British and the U.S. have been manipulating foreign news and propaganda for many decades with great success, and the church before them. But now the scale and the speed of that manipulation is perhaps too great to combat."

Ian Fish, ICT professional and specialist in information security based in Europe, said, "I expect the imbalance of power between the major global corporations and democratic national governments will increase to the detriment of democracy. I also expect non-democratic governments' disruption of democratic norms to increase faster than the democracies can react."

Puruesh Chaudhary, a futurist based in Pakistan, said, "Democracy needs to develop the capacity to negotiate in the interest of an ordinary citizen, who may not have direct influence on how key decisions play out in geopolitics but is invariably affected by it. The democratic institutions have to have systems that operate at the pace of technological advancements that have an impact on the society."

Trust suffers when people's infatuation with technology entices them away from human-to-human encounters

Several respondents argued there were circumstances when humans' "slowness" was an advantage, but that technology was thwarting that side of life. They believe that a major cause of the loss of trust is the fact that many people are spending more time online in often-toxic environments than they spend in face-to-face, empathy-enabling non-digital social situations.

Angela Campbell, professor of law and co-director, Institute for Public Representation at Georgetown University, said, "We are just seeing the beginning of how technology is undercutting democracy and social relations necessary to a democratic society. We don't have good ways of telling what is true and what is false, what is opinion and what is fact. Most people do not yet understand how power technologies (especially combined with a lack of privacy protections) allow them to be manipulated. In addition, as people spend more time using technology, they spend less time interacting with other people (in person) and learning important social skills like respect and empathy."

Yves Mathieu, co-director at Missions Publiques, Paris, France, responded, "Technology creates new forms of communications and messaging that can be very rough and divisive. Some contributors are rude, violent, expressing very poor comments, insulting or threatening elected citizens. There will be a strong need for face-to-face format, as the technologies will not allow process of deliberation. There will be need for regular meetings with voters, in meetings where people will have the time and the possibility to exchange arguments and increase their understanding of each other's position. Being associated with media, this will reduce the divide that we know today, as it will increase mutual understanding."

An anonymous respondent commented, "The expanded use of technology with respect to the democratic processes will tend to weaken one of the most important aspects of democracy and the democratic processes – the use of technology instead of person-to-person dialogue seriously degrades (or removes altogether) meaningful dialogue and exchange of ideas between individuals. When individuals use technology to express their political views/opinions instead of having direct human interactions, these views tend to be more extremely stated than if that person is speaking a view/opinion to another person. Also, in many cases, if someone else expresses a different view from what the original individual expressed, the first person is much less likely to pay any attention to a view expressed using technology than if that view were expressed in a person-to-person discussion. Additionally, the increased use of technology for analyzing segments of society to 'shape' delivery of messages for particular segments will result in an increase of messages that distort the reality of the message or distort the results of what the message is describing."

A futurist and consultant said, "Democracy currently has a crisis in global leadership. Without significant change in 2020, for which I am hopeful, I can't hold a lot of hope for democracy in 2030. I'm afraid the question is not what will change, but what must change. Without changes in democratic institutions, the future of democracy itself is in question. There is an urban/rural split at work in tandem with a severe disparity in the distribution of wealth – with climate change overshadowing it all. Technology will have a hand in providing as well as impeding solutions."

Arthur Asa Berger, professor emeritus of communications, San Francisco State University, commented, "People who use Facebook are affected in negative ways by a 'net effect,' in which they exhibit impulsivity, grandiosity, etc., as explained in my book, 'Media and Communication Research Methods' (Sage). Some young people text 100 times a day and never talk on the phone with others, leading to a radical estrangement from others and themselves. The internet is used by hate groups, neofascists, right-wing ideologues, terrorist organizations and so on."

An anonymous U.S. policy and strategy professional said, "Technology allows the creation of a bullying environment that polarizes people to the point at which they do not attempt to

understand other opinions or views, weakening public discourse and driving outrage and attacks on minority views."

Japheth Cleaver, a systems engineer, commented, "At the moment, the major social media networks function not by neutrally and dispassionately connecting disparate communicators (like the phone system), but are designed reinforce engagement to sell as many targeted ads as possible. This reinforcement creates resonant effects throughout a society's culture, and in-person contextual interaction drops away in favor of the efficiencies that electronic communication offers, but without any of the risk of the 'bubble' of the like-minded being dropped, as that would hurt engagement. Internet as communications overlay is fine. Internet as a replacement for public space seems detrimental."

Melissa Michelson, professor of political science, Menlo College, and author, "Mobilizing Inclusion: Redefining Citizenship Through Get-Out-the-Vote Campaigns," said, "The future will include a complex interplay of increased online activity but also increased skepticism of those virtual interactions and an enhanced appreciation of offline information and conversations. As more adults are digital natives and the role of technology in society expands and becomes more interconnected, more and more aspects of democracy and political participation will take place online. At the same time, the increasing sophistication of deepfakes, including fake video, will enhance the value of face-to-face interactions as unfiltered and trustworthy sources of information."

Anonymous respondents commented:

- "Unless there is transparency, tech will be the new digital atomic bomb – it has moved faster than individuals' or the law's understanding of its unintended consequences and nefarious uses."
- "At the current rate of disregard and lack of responsibility by those who own and run large tech companies, we are headed toward a complete lack of trust in what is factual information and what is not."
- "Public institutions move slowly and thoughtfully. People doing nefarious things move more quickly, and with the internet, this will continue to challenge us."
- "It is the personal and social norms that we're losing, not the technology itself, that is at the heart of much of our problems. People are a lot less civil to each other in person now than they were just a few decades ago."
- "More access to data and records more quickly can help citizens be informed and engaged, however more information can flood the market, and people have limited capacity/time/energy to digest information."

4. Hopeful themes and suggested solutions

About a third of the experts who responded to this canvassing said people's uses of technology will mostly strengthen core aspects of democracy and democratic representation. This section includes comments about hopes for the future that were made by all respondents, whether or not their answer in this canvassing was that democracy will be strengthened. These more hopeful themes and suggestions are organized under seven themes.

Evolving individuals: Increased citizen awareness, digital literacy improvements and better engagement among educators will be evident in the next decade

Beth Noveck, director, NYU Governance Lab and its MacArthur Research Network on Opening Governance, also has confidence in the public's ability to make a difference. She wrote, "Because of the work that so many people are undertaking to transform our institutions for the better, I remain, despite pressures to the contrary, optimistic about the power of technology to make it possible for citizens to participate in new and better ways in governance using new technology. This is what I call crowdlaw. If we continue to experiment with building better crowdlaw tools and practices, the public will be able to inform the agenda-setting process by sharing what they know about problems as they experience them. They will be able to do more than identify problems. They can contribute solutions to problems and deliberate with other citizens to craft and refine those solutions. They can and should be able to participate in drafting policies and proposals. Perhaps most important, they will be able to collectively hold government to account by tracking the effectiveness of the implementation of new policies and services. Finally, they will be able to exercise decision-making authority, voting on how money is spent and power wielded. With new technology, we can experiment with new ways of doing such things, too, including comparing the impact of having people volunteer to participate in such online processes versus selecting a sample of people to participate. There is much work to be done to test what will work to improve the impact of new technology on democracy in 2030."

Charlie Firestone, executive director, Communications and Society Program and vice president, Aspen Institute, commented, "For the next four to five years there is likely to be more surveillance techniques, e.g., facial recognition; more deceptive activity over the internet, e.g., deepfakes; and more sophisticated means of manipulation of user data to gain advantages from those users. But I am hopeful that there will be a reaction to these abuses coming to fruition in the latter 2020s, resulting in new and better uses for democratic purposes."

Christopher G. Caine, president and founder of Mercator XXI, a professional services firm helping clients engage in the global economy, commented, "We are living in an era of radical

transparency enabled by the diffusion of technology and its distributed capabilities. We are learning how to live in this environment right now, and our skills will improve over the next 11 years. Our judgment and awareness of the implications of statements and behavior will evolve and 'mature.' I believe and am hopeful this will bring us back to a more shared-values-based society."

Tony Patt, professor of climate policy, ETH Zurich, and author of "Transforming Energy: Solving Climate Change with Technology Policy," said, "Democracy is a tool to manage problems in a way that takes into account diverging goals and objectives in society. It allows people to accept and support the solutions even if they do not enthusiastically support them. To a large extent, this represents an issue of data and information management. So, advances in data and information management will have a large impact on how democracy functions. I believe in people's desire to make the world a better place for their children. So, where things happen that create both opportunities and threats, we are likely to take advantage of the opportunities and deal with the threats. In the long run, change will be more likely positive than negative, even if in the short run there are major problems."

An entrepreneur based in Southeast Asia said, "What do you expect democracy to look like in 2030 from the perspective of citizens? Educated citizens who also understand how the internet works will become more-aware citizens. What aspects of essential democratic institutions will change? More-aware citizens will likely be active participants and contribute to society by volunteering or by making choices/decisions that are for the betterment of society. What role will technology play in whatever changes take place? Technology will make educated citizens, who also understand how the internet works, more aware."

Torben Riise, CEO with ExecuTeam Inc., based in Phoenix, Arizona, said, "As the young generation comes of age as voters and as electable individuals, and as young people will depend almost exclusively on the digital world, technology will become THE factor that most will impact the democratic process. That requires a well-educated population in terms of discerning facts from 'fiction,' as the strength of the process also is the weakness of the system (until security like blockchain plugs the holes in the system). If the benefits outweigh the risks, as I believe they will, this will strengthen the political system by 2030."

Rebecca Theobald, assistant research professor, University of Colorado-Colorado Springs, said, "After dealing with the unpleasant aspects of social media and gerrymandering, for instance, academics, voting-rights advocates and community organizations are working to make sure technologies such as geospatial technology work for good of many rather than for a few."

Jeremy Malcolm, director of the Prostasia Foundation, formerly with the Electronic Frontier Foundation, wrote, "By 2030, most of those in government will have grown up with the internet as an integrated part of their daily lives. There will be less of a perception from these people that the internet is something new and fearsome that has disrupted the way that life was before. They will be well aware of the strengths and weaknesses of the internet in relation to political organizing and will have adjusted their expectations of what government can (and cannot) do to control these effects. This will result in a realignment of power between governments and whichever actors then have more control over online narratives – which might not be the same actors as today."

Daniel Estrada, digital humanities and ethics lecturer at New Jersey Institute of Technology, said, "The internet has been a bastion of democracy and education – an anarchist space – from its earliest days. Its early participants understood that the new space required developing new cultures, norms, aesthetics and practices of engagement and moderation. These were the cultures developed on message boards and Internet Relay Chat channels, that primordial soup from which the memes of today first emerged. But in the last decade, the internet has consolidated around a few major tech channels: Facebook, Google, Apple, Amazon. A techlash that targets these big companies will make room for the internet to return to its early values of digital anarchy and free education. These changes will take two forms. First, there will be growing public support for regulation and oversight of the big tech companies, especially in the use of targeted advertising. Second, and more importantly, we'll see further fragmentation of internet cultures, away from the consolidated streams and toward more niche community spaces that are independently moderated, like early internet or cable TV. Self-moderating, self-organizing cultures will provide a basis for demographic-focused advertising without the anti-social consequences of targeted advertising, allowing the internet to self-organize a healthy diversity of cultural and normative frameworks. I believe this will ultimately strengthen public education and democracy."

Marcus Foth, professor of urban informatics, Queensland University of Technology, explained, "The internet's early heyday painted perhaps romantic pictures of the democratisation of knowledge, participatory culture and the global village. Today these visions have largely been replaced with much more realistic, pragmatic, opportunistic perspectives that ground the internet's benefits in realities of walled gardens, platform economies, corporate interests and data harvesting. I believe as a result of this more balanced and mature view of the internet's actual pros and cons today, democracy in 2030 may benefit and be strengthened not just from the usual allies such as progressive academics, human rights and environmental groups. New segments of society are starting to get concerned and be protective of the internet's role in the future of democracy."

A researcher based in Norway said, "We have not yet learned how to use the internet and are now experiencing whiplash. The internet is not a neutral channel for communication. People are

sometimes only aware of short-term shortcomings and not of long-term benefits of a policy – everyone screams, no one reads. However, I believe that we can and will learn how to make the internet a tool for democracy mainly because that is the only choice we have – we cannot and do not want to make the internet go away."

Barry Parr, technology marketer at Delphix, previously an innovator and analyst in online journalism, said, "Citizens will be better informed and better organized than they are now. There are certainly risks of misinformation, but these are outweighed by the general availability of quality of information and tools available to those who are working to make civil society better."

Sanoussi Baahe Dadde, a self-employed internet consultant, said, "I would like democracy to look like trade in 2030, where people everywhere will understand that 'I have a choice,' which means it is not by force that a party can win election, but by the voice of people."

Deb Socia, executive director, Next Century Cities, said, "Access to technology will allow greater participation in the democratic process. The opportunity to share concerns and celebrations asynchronously, to sign up for services, to participate in decision-making are all made easier when technology is involved. I think of options like participatory budgeting, the immediate sharing of the existence of a community hazard, the opportunity to watch and participate in city council hearings, the ability to engage with elected officials online as examples of how technology is enhancing engagement today. I can only imagine how technology will provide further enhanced engagement options in the future."

A professor known for her research into online communications and digital literacies said, "Having so much information so freely available is a good thing and a bad thing at the same time. How will we respond in terms of how we regulate, educate, make new laws and so forth? There is a learning curve with new technologies in terms of separating fact from fiction. The internet poses the most sophisticated challenges yet in this regard; it's so easy to manipulate and make fake things look real. Yet, I have faith that as humans evolve to catch up with their technologies, we will learn how to be more discriminating and careful. Most people today know what a piece of junk mail is; the same can't be said for years ago. Yet with all of that said, I do worry about the near future, especially with conspiracy theorists being invited to the White House and the false equivalence fallacy everywhere (my idea is as good as yours; my understanding of vaccines is as good as the understanding of a medical doctor). By 2030, I expect the technologies to be more sophisticated, and I also hope that the big Western democracies will keep working on the problem."

Cheryl B. Preston, an expert in internet law and professor, Brigham Young University Law School, said, "With time, citizens will become savvy in distinguishing legitimate information online. They will be thus better informed. Social media are more than the deliverers of news; they uniquely bring users into the conversation. Anyone with an opinion can be a political pundit for those who follow their social media accounts. Recipients not only read their peers' political views, they also 'like,' share the post or start up their own commentary. Those who shared or commented are often forced to defend their comments in response to pointed disagreement, and thus develop a personal stake in the controversy. Social media users acquire political power. As Sarah Tran argues in 'Cyber Republicanism,' 'Beyond their mission statements, social media sites have built-in mechanisms for discussion and debate among citizens. … The threat of a viral uprising can motivate government actors and special-interest groups to listen more closely to public concerns. It can further entice them to spend more resources on educating the public about issues of national, regional and local concern.' Social media not only give users an added measure of interactivity, they also grant their users the ability to acquire political power. One study found that 'interactive online communication is positively related to participation' in political activities. Thus, the Net generation, along with many Americans, have become activists. This wealth of information and depth of involvement will increase over time."

Tracey Follows, futurist and founder, Futuremade, wrote, "One is more likely to ignore a fact that does not fit one's world view than change one's world view to fit the fact. Human nature is stronger than social media. However, social media has changed the nature of institutions because the messaging is no longer one way and broadcast, but two way and dialogue, and by virtue of that means that institutions have to be open to criticism, and question. We can only expect more of this over the next decade or so to the point that almost every policy, statement and utterance an authority or institution makes in the future is immediately questioned in detail and in public, rather than is taken as objective fact. That is what has changed and will continue to change."

Charles Ess, professor of digital ethics, at the University of Oslo, said, "Some hope may lie in approaches such as 'privacy by design' or 'ethically aligned design' (IEEE) and the EU initiatives to preserve democratic rights and our impulses toward good lives flourishing. These will require increased citizen awareness and engagement, which in turn requires strong support by educational and governmental institutions."

Mary Griffiths, associate professor at the University of Adelaide, Australia, an expert in digital citizenship and e-government, said, "My hope is that liberal representative democracy will still look the best option from a citizen's perspective in 2030. If it does, that will mean that democratic institutions have survived more than a decade of technology-enabled challenges, and also rebuffed the political alternatives that the rise of nationalist race- or class-based populism, the artificially

created social divisions and the tightening of information security legislation by more authoritarian governments can offer. It would also mean fewer charismatic figures appearing on the political scene to present a spurious version of 'direct democracy' to citizens aided by access to and support from as-yet-unaccountable global technology platforms. But – and it's a big but – can we be sure this will happen? Citizens deserve a liberal democracy and we all have responsibility to consider not only self-interest but the collective good in a polity. These ideas are key, and technology offers multiple ways to communicate them positively. What is essential for the future of democracy? Better-supported K-12 education systems where critical thinking is taught every day, along with routine civility, openness to new ideas, the importance to the whole collective of a free press and the expectation of peaceful transfers of fairly elected power. The impact of technology on democratic institutions has been simultaneously negative and positive. Positive institutional change may come from the distribution of mass calls for greater transparency and accountability in government, and the mobilising of support for progressive social and economic changes."

Valerie Bock, VCB Consulting, former Technical Services Lead at Q2 Learning, responded, "We are beginning to understand the weaknesses in current technologies and are in the process of addressing those weaknesses, as well as developing more sophisticated ways of interpreting the information they provide for us. I am hopeful that by 2030, the concentration of power will have been reversed somewhat, and citizens will have a renewed sense that their vote matters, that it is important to inform themselves, and that they know where to find reliable sources of that information."

June Parris, a member of the Internet Society chapter in Barbados, wrote, "Technology should close gaps between various members of society, however, I can see that it may drive society apart. What is actually taking place is that it is being used to further and improve the lives of those that are already actualized, and some members of society are left out. Democracy should be inclusive, yet the gap between rich and poor is widening. We can work to prevent this from happening by being more inclusive."

Anonymous respondents commented:

- "More people, both in roles inside institutions and as individuals, will become more tech savvy, and new approaches to reaching out to people, to educating citizens, to interacting with individuals and with institutions will develop and continue to be developed as technologies emerge and evolve."
- "We need to educate people about the ways in which their opinions can be manipulated."
- "I expect to see better-informed decision-making, from government policy down to individual vote choices at the polls."

Adapting systems: Changes in the design of human systems and an improved ethos among technologists will help democracy

Brian Southwell, director, Science in the Public Sphere Program, RTI International, said, "Some observations from the 1920s, e.g., Walter Lippmann's 'Public Opinion' or 'The Phantom Public,' about the opportunities for and limits of public opinion as a source for governance, are still relevant today. New technologies theoretically offer some promise for new mechanisms for representation, and yet we still do not have widespread use of electronic voting. New technologies offer some promise for citizens to communicate horizontally rather than depending on major news outlets, but then we also have seen some dysfunction in that regard. Insofar as new technologies allow us to gather and focus together on central issues of concern, they will improve our democratic institutions. If we allow them to divide people into specialized groups, then there is some threat in the use of those technologies."

Louis Gross, professor of ecology and evolutionary biology and mathematics, University of Tennessee-Knoxville, said, "I expect that many organizations (religious, cultural, educational) will band together to enforce data privacy for their members and will be an effective political force to bring about legislative action. New means to carry on discourse that have data privacy constraints built into them will be developed and flourish. I anticipate continued development of tech tools for individual use that constrain the availability of personal data, as well as tools at above-individual level that carry out a variety of automated checking of online materials that individuals can connect with to decide what is best from their perspective. I also anticipate very strong legislative action to protect those individuals who do not have access to these tools, including the young and those who are not otherwise capable of protecting themselves."

Gary L. Kreps, distinguished professor of communication and director of the center for health and risk communication, George Mason University, said "Unless there are major public information technology policy changes that are designed to protect against organized misinformation campaigns, there will not be much progress in providing the public with information needed to participate meaningfully in making informed governance decisions. Efforts need to be made to identify organized misinformation efforts and remove them from the infosphere. Moreover, government agencies must aggressively identify misinformation perpetrators and prosecute them to the full extent of the law. Automated review technologies can be employed to identify organized misinformation efforts, but strong policies and programs are needed to uproot these unethical communication practices."

Jennifer Jarratt, co-principal of Leading Futurists LLC, wrote, "Almost all of our democratic and political systems are obsolete, based on old assumptions that mostly are not now valid. We

need a new Constitution, for example. Digitization brings us wonderful tools, the potential of much data and new freedoms – we just don't know how to use or work them yet. The years between now and 2030 will be our time to learn and adapt."

Marshall Ganz, senior lecturer in public policy, Harvard University, said, "What conditions do we think can influence the use of tech in ways that can strengthen, weaken or have no impact on democracy? For me these conditions include political choices we actually make about the regulation of technology, about concentrations of power (and wealth) facilitated by 'first user' advantages when a new technology comes along, realistic control of campaign spending (almost infinite demand stimulated by profit-based use of new technologies), capacity of civic organizations to learn to use the tech to strengthen collective capacity rather than weaken it, etc. The combination of technological development that enhances aggregation of individual inputs, rather than the building of collective capacity, in the context of an increasingly unregulated marketization of politics, has been very problematic. I wrote a piece on this called 'Voters in the crosshairs: How technology and markets are destroying politics,' published in a 1994 American Prospect."

Mark Jamison, a professor at the University of Florida and visiting scholar at American Enterprise Institute, previously manager of regulatory policy at Sprint, wrote, "Well-formed democratic institutions have proven to be quite robust through technological change. The greater challenge to institutions that are intended to protect our freedom is whether we will live with the integrity and character that is necessary for freedom to endure. Failure to live up to this challenge has caused other free peoples to lose their freedom over the centuries."

Eline Chivot, a public policy researcher for the Center for Data Innovation, commented, "Democratic processes and relations will no longer be about nations as a state actor or cities as their challengers and closed-door negotiations with national flags in the background. State actors will remain important, but democracies' policymakers/officials will increasingly work based on the acknowledgement that there needs to be new partnerships between governments and industry/tech companies. These have taken on roles and sizes that are comparable to foreign policy actors. It's an opportunity to share expertise and protect borderless societies, e.g., tech companies have the tech expertise, the data and the means to secure cyber infrastructure and help in preventing data breaches, election meddling or supporting police investigation."

A leader for a foundation wrote, "If people take action – governments coordinate with tech companies to eliminate abusive practices; government provides unified, systematic protection against foreign as well as domestic attackers; users are better educated on the risks; users are

responsible users of tech – then tech could significantly enhance core aspects of democratic institutions."

Erhardt Graeff, a researcher who studies the design and use of technology for civic and political engagement at Olin College of Engineering, said, "Technology and its designers will continue to play a role in making this transformation in our democratic culture easier in some ways and harder in others. We simply cannot rely on technology for the democratic culture change we need. Democracy and democratic representation will be both strengthened and weakened by technology use over the next decade. The most important moves for reinforcing democracy during the next decade will likely be ideological and organizational rather than technological. Recent efforts by technology workers to organize themselves in protest to the policies, engineering decisions and business practices of their employers, which join increasingly vocal demands from the press and politicians to change their ways, should mean that technology culture starts to be more accountable to democratic public interest. One likely result is major technology companies will become more conservative in their design – less willing to dramatically change patterns of communication affecting democratic practice. This will hopefully reduce the ability of antidemocratic movements to amplify their efforts through platforms. But this will also likely lead to rollbacks of designs that allow pro-democratic movements to benefit from amplification. More mass movements advocating for democratic renewal are needed to actively resist antidemocratic trends in our systems of governance and the ways technology is used. These movements must focus on a broad-based organizing and alliance building to catalyze cultural changes that spread values and norms of democratic practice in ways that emphasize equity and social justice, such that we can work toward building and rebuilding democratic institutions that are more inclusive and robust."

Knut Erik Solem, professor of environment, technology and social change, Norwegian University of Science and Technology, said, "Liberal democracy will survive and likely outcompete all other sociopolitical systems provided it maintains and further develops its key element of empathy."

Devin Fidler, futures strategist and founder of Rethinkery Labs, commented, "Social media technologies today are really still in their infancy. Research being done in areas like human computation and crowdsourcing and collective intelligence suggests that these systems can be greatly refined toward specific targets, including strengthening democratic governance. This is interesting because it allows us to design and optimize a new generation of **organizational technologies** that combine what we have learned about digital orchestration with generations-old thinking about designing institutions and governance mechanisms for specific outcomes. However, as with all large-scale business activities in history, legislation will be necessary to

ensure that the public interest as a whole is protected when it is in conflict with financial motives. At a minimum, we need researchers to systematically identify the positive and negative externalities that these tools have on our organizational technologies and social operating systems. The Federalist Papers demonstrate that the framers of the U.S. Constitution explicitly saw the creation of the government as a design problem. As an 'operating system,' their design has been remarkably resilient. But it was not designed to support the organizational technologies that digital networks make possible and needs to be patched to avoid a crash. This redesign is a problem that Silicon Valley has many tools to help with. But is will take a civic mindset that Silicon Valley is less familiar with, rather than the venture capitalist-centric innovation model still at the center of the tech world today. Failure to integrate this wider 'social operating system' perspective will perpetuate techlash and ensure that the 'bugs' that new technologies are causing in society will only get worse."

The president of a major foundation said, "If the tech giants can abandon their blatant political biases, their shallow, malevolent, surreptitious, crass manipulation of information and their heinous abuse of power, emerging digital horizons have a wonderful chance to allow every citizen a fresh new world of excellent journalism, opinion and commentary."

An anonymous respondent commented, "One challenge is to not look at evolving uses of networked media by bad actors, but to look at larger structural issues that weaken competition. As with infrastructure and networked industry sectors (water, electricity, transportation, telephone), there may be advantages to large firms that allow them to obtain and exercise monopoly power. Looking at mechanisms such as structural separation of different activities may be one way to reduce the power of certain platform firms and also to reduce the political vulnerability that arises from such concentration."

Jeremy Foote, computational social scientist and professor, Northwestern University, wrote, "It is tempting to think that the problems of technology that we have now will continue to be problems in the future. None of the problems that we have now – from privacy concerns to disinformation bots to polarization – seem tractable and amenable to technological and legal remedies. Despite the problems we have had, I still believe that the broader implications of the internet as a tool for connection and conversation and individual expression are more closely aligned with democracy. That is not to say that there are not other dangers. Facial recognition-enabled surveillance and artificial intelligence and simulated videos all pose real risks. However, I think the most likely outcome is that we find social, legal and technological compromises that allow us to gain some of the advantages of these technologies while avoiding their worst dangers. For example, while surveillance technologies dramatically reduce the costs of surveilling citizens, it is difficult to imagine a scenario whereby current democracies accept Big Brother-like

surveillance. Democratic institutions are set up to identify and regulate these sorts of dangers, and, so far, they have been adequate in doing that."

Scott McLeod, associate professor of educational leadership at University of Colorado, Denver, wrote, "The importance of legal systems, especially regarding related information technologies, artificial intelligence and machine learning, will play a very significant role. In terms of the 'Network Society' (per Manuel Castells) and democracy in the U.S. – and regarding Castells' juxtaposition of Net and Self (e.g., diverse identities as voting groups), technology will continue to co-constitute a 'liberal democracy with well-established and reasonably effective political institutions headed up by a credible system of electoral representation,' supported especially by the U.S. legal system. Technology will change the following four democratic institutions by 2030: 1) Free, fair and frequent elections. 2) Freedom of expression. 3) Independent sources of information. 4) Freedom of association – mediated by information technology but safeguarded by the Constitution."

Michael Muller, a researcher for a top global technology company focused on human aspects of data science and ethics and values in applications of artificial intelligence, said, "The U.S. and EU should recognize this threat as a major research opportunity, and should engage with academic, commercial and nonprofit partners to create effective early-warning systems and appropriate countermeasures. This research will need to include computer science, social science, political science and ethical issues as analyzed by multiple fields. The problem is at least as important as the long-term research funded by, e.g., NASA, and should be funded at the level of a 'democratic space program,' with enormous benefits to science, commerce and society."

James Gannon, a cybersecurity and internet governance expert based in Europe, said, "Democracy is a process; processes are by their very nature subject to disruption both in the positive and negative. I believe, hope, that democracy in 2030 will be dealing with the fallout of the populist years, where nations realised that disinformation and intellectual warfare were dangerous concepts that drove democracy to the edge of viability. One possible scenario: In the 2020s an international effort was undertaken to establish norms for intergovernmental attacks (similar to the Geneva Conventions) that drove institutions to look at both operating more independent sources of information (such as the Irish Referendum Commissions) and that use of fact-checking and independent verifiability of critical information was defined as critical to a functioning democracy, NGOs and IGOs were established to assist with election security as an end-to-end process, with increasing standardisation globally, both reinforcing developed nations, and supporting developing nations. Technology played a critical role, with technology helping fight disinformation, and also a move away from vulnerable electronic voting systems, back to verifiable paper ballots."

A psychologist, researcher and author wrote, "Right now, it is a dangerous situation. I fear that we will continue to lose control over even-handed delivery of truth, facts, objectivity. The polarization, nationalism and hate seem difficult to control, especially when used by current governments and parties. The popularity of several nationalist authoritarian leaders is frightening, and their use of tech to distort truth, lie and convert voters is powerful. This can only change with radical new tech ethics – something our current leaders undermine. If places like The Center for Humane Technology gain visibility and impact and there is a sea change in the polarization of previous allied countries, there is hope."

Artur Serra, deputy director, i2CQT Foundation and Research Director of Citilab in Catalonia, Spain, wrote, "Democracy in 2030. 1) I expect the birth of the first democratic systems working with the basic rules of the Internet Engineering Task Force: 'Rough consensus and running code.' 2) Changes: I expect the birth of the first end-to-end democracies, based in a radical reduction of the central government role, the empowering of the edges of the political system, with a generation of a distributed political system. Only these systems can allow a climate of international collaboration native to the internet. 3) 'Technology's role.' The role of the internet is to inspire how political systems of the 21st century could be organized and work nationally and globally. 4) No changes will mean an increasing control by new digital hyper-corporations on one side and a progression of digital authoritarian regimes on the other, ending probably in a final fragmentation of the internet."

Scott Santens, an activist for basic income whose writing has appeared in The Huffington Post, The Boston Globe, TechCrunch, Vox and Politico, commented, "By 2030, unconditional basic income (UBI) should exist, which will have a significantly positive effect on democracy by reducing economic insecurity and enabling people with the mental space and time to be more civically engaged. I expect important reforms to have occurred, like ranked-choice voting, fair representation multi-member districts, automatic voter registration, open primaries and democracy dollars, so that technology utilization works better with democracy instead of against it. The rise of negative partisanship enables tech to influence democracy in negative ways, so making the changes necessary to reduce partisanship will change the way tech interacts with democracy for the better."

Alexander Cho, digital media anthropologist and postdoctoral scholar expert in youth and social media at the University of California-Irvine, wrote, "Government entities as well as the private market need to actively develop process checks that come up to speed with the flow of information that digital media has enabled."

Julie Cohen, professor of law and technology, Georgetown University, said, "Weakening is not inevitable, but there is a negative feedback loop resulting from underlying political polarization/gridlock/dysfunction, enhanced by current configurations of networked media optimized for ad revenue and time on device. That feedback loop needs to be disrupted in order to salvage democratic processes/institutions, evidence-based policymaking and the rule of law."

Sharon Sputz, executive director, strategic programs, Columbia University Data Science Institute, said, "Technology can be used for good and evil, but I believe humanity will prevail. The spread of knowledge is enabled through technological advances. This spread of knowledge reduces oppression and increases our ability to raise the education and prosperity across the globe. The larger issue we face is the changes to our planet that will cause disparities."

An economic development and social innovation consultant whose specialty is purpose-driven emerging tech said, "I expect the size, values and expectations of Gen Z as well as technological progress in the next decade to enable more direct participation, with the potential to augment, and in some cases to replace, aspects of representational models of government. Though much smaller in population, countries like Estonia have pioneered digital democracy initiatives that can be emulated."

A distinguished fellow at a major futures consultancy said, "Democracy is a messy business. We can access, remember and amplify discussions at an unprecedented level. Our conversations are busier, louder and more likely to reflect emotion than informed thought. Who thought democracy should reflect the conversational norms of the upper-middle class? We will experience more chaos and ephemerality in the national exchange, some of which will be tweaked by hostile voices. It is important to recognize these patterns and intentionally reshape institutions so that we can keep moving forward."

Daniel Rogers, cofounder of the Global Disinformation Initiative, wrote, "We are at a crossroads when it comes to the impact the internet will have over the next decade. The internet was founded by idealists who believed in transparency and the free exchange of information. That transparency and decentralization led to tremendous advancement, from the Arab Spring to the #MeToo movement. But the internet is no longer dominated by such idealism, and instead is dominated by the largest for-profit, ad-driven business models in history. Fundamentally, these business models are toxic. They turn the users into products that are commoditized and sold to a small number of marketers who control the pipes and the conversation at the expense of the users, their data and their privacy. These models reward increasingly divisive and toxic content, as that garners attention and keeps the users' eyes on the screen. And as these behavior modification tools become more sophisticated and ubiquitous, they attract the employment by authoritarians around the

world, shoring up the toxic business models in a vicious feedback loop. The good news is, we know this, and we can change it through strong privacy regulation, antitrust, strong content moderation and platform liability, and other regulatory and civic interventions. But such change will require political will, and I'm not yet convinced we have it. So, while I'm bullish on the long-term positive impact the internet will have on the world, I'm 50/50 on whether we make it there without destroying ourselves first."

Anonymous respondents commented:

- "Democratic institutions will be impacted by a much-needed change following a likely dramatically uncomfortable backlash about race, economic status and privilege."
- "It will require action by governments to utilize technology for good – but we are still in the early days of government implementing technology-driven approaches, and I am not optimistic government will move fast."
- "The strongest lever on the outcome of democracy will be the people who wield power to utilize and control these technologies and others. … The broad sociological and psychological manipulations that are made possible by the current state of these technologies are alarming and not to be dismissed."

Enshrining values: Deep-rooted human behaviors have always created challenges to democratic ideals. Historically, though, inspired people have shown they can overcome these darker tendencies

Lee McKnight, associate professor, Syracuse University School of Information Studies, commented, "Following the grand reveals of how undemocratically inclined billionaires (including, but not only, Putin) used data analytics and widespread internet platforms to manipulate the UK into Brexit and the U.S. into electing an unqualified president, I am optimistic for the future. The clear and present danger to democracy that technology-enabled manipulation of individual citizens and wider public opinion represents is now far better understood and more widely recognized. The UK cutting off its nose to spite its European/global face – at the behest of the out-of-the-shadows Mercer family, and of course the Russian oligarchy – will be an ongoing object lesson in the severe consequences of democracies letting their guard down. These recent 'shocking' lessons of the many mortal threats to democracy are really just common-sense ones from the past we are all painfully relearning. Use of technology to manipulate 'public opinion and propaganda' were widely understood and appreciated to be significant challenges in the 1930s, for example. But those lessons had been largely forgotten with the passage of time since World War II and the Cold War. Until now. Trust in democracy and civil society, however, can be rebuilt and

extended throughout democracies also with the help of technology, as for example blockchained, tamper-proof voting records (plus old-fashioned paper receipts) will both trust and verify elections automatically by 2030. More generally, secure cloud-to-edge architectures can limit mischief and mayhem attempted to similarly manipulate cities, communities and states as was done to the UK and the U.S., whether attempted by ransomware gangs/firms, billionaires, firms or by nation-states, with people and technology thwarting attempted manipulation of democratic processes for undemocratic reasons."

Alex Halavais, associate professor of critical data studies, Arizona State University, wrote, "There is a growing thirst for trustworthy reportage and data, and some are willing to pay a premium to get at the truth. Networked technologies may allow for new voices that revitalize public information. I fear that we may see a growing gap between voters who are basing their opinions on advertising-based media and those who can afford a direct subscription to less-biased sources of information."

Valdeane W. Brown, scientist and expert in biofeedback, Zengar Institute, wrote, "The simple truth is that 'technology changes everything' and the negative aspects of techlash are very similar in character to all prior technological advances, especially in relation to information dissemination. Look at the role played by Thomas Paine's 'Common Sense' in the American Revolution, FDR's use of radio for his 'Fireside Chats' and Kennedy's performance in the first televised debates and Trump's use of social media. While I disagree with the outcomes of that last effort, Trump effectively used the emergent technology and others didn't – he succeeded; they failed. Disinformation and misinformation still inform, so it's critically important to keep ALL forms of information flowing. The American Revolution and its push for independence was really only supported by less than 40% of the country and Thomas Paine and other writers of the day were an enormous support to that effort. We must do at least as well now and into the future."

Gabriel Kahn, former bureau chief for The Wall Street Journal, now a professor of journalism researching innovation economics in emerging media at the University of Southern California, wrote, "My hope is that the current backlash against the arrogance, concentrated power and lack of responsibility of big tech translates into some concrete regulatory action that levels the playing field. In addition, my hope is that all the attention given to this issue now creates a more sophisticated media consumer."

Warren Yoder, longtime director of the Public Policy Center of Mississippi, now an executive coach, responded, "Much will change in the practice of representative democracy by 2030. Democracy is an ideal that must be substantiated in a particular practice. Representative democracy is the predominant practice now, but it is inherently fragile and must be re-formed

every political generation. Winning political power in a representative democracy requires skills and resources that elites learn to control. But elites are prone to gradually isolating themselves in self-referential communities. The politicians, operatives and supporters all have much the same education, experiences and life chances. As times change, they lose the ability to create compelling accounts that represent the new reality. The Great Recession, several foolish wars and growing inequality created such a generational change. The digital world allows many new actors to participate in forming new accounts and competing for power. We are at a low point in the changeover, with populist leaders using digital media to command the political narrative. But this has happened many times in the past with pamphleteers, muckraking newspapers, radio, deregulated television. Each time the political world reformed itself with new elites that mastered the new world. The changeover is already happening. From the current low point things will get better, just in time for a new generational crisis beginning soon after 2030."

E. Melanie Dupuis, chair and professor of environmental studies and science at Pace University, said, "There is no essential goodness or badness about this technology itself, only about the health of the civil society in which it is embedded. The forces threatening democracy in the U.S. existed long before the internet. Nativism, lynching, Jim Crow all existed before the internet. It was just easier to ignore. In many ways, the internet has provided a mirror that enables Americans to see who they truly are."

Eileen Rudden, cofounder and board chair, LearnLaunch Inc., said, "Human beings are not governed by rationality, they are governed by their innate human animal tendencies. Technology is unleashing human tendencies that are not new; in the past they have been shaped and molded and constrained by community norms. Those norms have been 'enforced' by church, by community, by family. Many of the constraints on human behavior – shared community, religion, family – have been loosened over the past 50 years. Technology is enabling more people to express the bad human traits as well as the good. But the bad traits have no modifiers or constraints. While we have invented new technologies, we have not yet invented systems of social norms that work online. The issue is not the platforms, it is the people. These platforms have unleashed the people into a culture without restraint. How will we build new norms and cultures for this era? I don't think regulating Facebook is the answer to this question."

The program director of a university-based informatics institute said, "Human nature will drive technology use for individual benefit, not societal. Societal benefit needs some measure of altruism to effect positive change. Technologies are, however, leaning to catering to individual 'likes' and a 'vote by click' phenomenon. The two paths are divergent."

Clifford Lynch, director, Coalition for Networked Information, said, "Democracy in the U.S. is clearly in serious trouble, but I don't think that technology is the direct driver. Technology has facilitated or exacerbated many of the problems by facilitating tribalism, extremism and extreme partisanship, the easy spread of misinformation and disinformation, commerce in personal data and social media in particular has had a corrosive effect on some parts of the social fabric (though strengthening other parts) – but these problems run deeper than technology."

A professor and director of a major UK-based foundation commented, "The architecture of social and digital media have developed without any sense of how they might be used. We spent 15 years thinking they were like infrastructure. Many academics were seduced (against the historical evidence) that this new form of media would be positive, enhance organisation and knowledge, make mobilisation easier and so on. They do, but they do so for ANY kind of value.... We don't have any regulatory practices fit for controlling it. The architecture of communication now enhances like-minded solidarity and delegitimises opposition. People can live in self-righteous bubbles and, having made their minds up on issues, are sectarian and partisan and behave more like crowds. So, representative democracy is giving way to plebiscites and division."

Amy Sample Ward, a director with the Nonprofit Technology Network, said, "The internet is a tool, not a solution. And I believe it to be a tool that can be used for transparency, visibility, connection and engagement. As such, it can be used for change, and change is essentially what democracy is about. I'm optimistic that as more and more people get online, we have more participants connecting and engaging, and more people (more diverse people) creating the technologies that support democracy."

Garland McCoy, president, Technology Education Institute, said, "History is instructive in addressing the question. Think of the control over content the teletype companies like Western Union had. The power people like William Randolph Hearst had to impact news and J.P. Morgan financial markets. Think of privacy during the decades when folks shared 'party lines' or lived in small communities for generations never venturing far from home. We have been here before and will use the tools of ever advancing technology to get the information we need from sources we trust. Good old fashioned 'analog' 'walking around money' still impacts elections far more than the digital internet social media and search platforms."

Gianluca Demartini, senior lecturer in data science, University of Queensland, wrote, "Information and communication technologies have been influencing democracy since its existence. Newspapers, television and later the web as a means to receive information has shaped our decision-making processes. Over time, available information has increased and our decision-making processes have adapted. In future, processes will be affected more as more technology-

supported information will be available. Society will adapt to this increasing amount of information."

Ray Schroeder, associate vice chancellor of online learning, University of Illinois Springfield, wrote, "Our democracies will look much the same in 2030. They will be enhanced by online voting and will be strengthened by secure technologies. We have faced many deception challenges over the years – from political cartoons and yellow journalism in the pre-internet era to 'photoshopping,' trolling, spamming and other 'dirty tricks' strategies of more recent years. Truth is resilient and durable. It has persevered through those times and will do so again in the face of more technologically sophisticated assaults – and so will it and democracy upon which truth is dependent."

Managing for good: Governments, enlightened leaders and activists will help steer policy and democratic processes to produce better democratic outcomes

Ryan Sweeney, director of analytics, Ignite Social Media, commented, "As I see it, the largest factor in how we look as a democracy in 2030 comes down to the actions of elected leaders and the citizens they represent. I would expect that in the next decade there will be shifts back and forth. Technology can be an instrumental tool of revolution in the same way it can be an instrumental tool in oppression. We as citizens will continue to use emerging technology to make our voices heard while those in power will attempt to leverage technology to work for them."

Deana A. Rohlinger, a professor of sociology at Florida State University whose expertise is political participation and politics, said, "The technology pendulum, which swings back and forth much faster than the political pendulum, is headed in the direction of increased governmental regulation of the technology companies frantically avoiding the 'media company' label. Facebook, Amazon, Google and others will be forced to be better actors in marketplace – and unlike previous public debates regarding the role of media in deliberative processes – the discussions and resulting policies will explicitly address the role of information and ICTs in democratic institution building."

Chrissy Zellman, a manager of digital and interactive strategy in the health care industry, commented, "First and foremost, the dynamics and makeup of Congress needs to change before 2030 in order to better protect, regulate and govern technologies. In the 116th Congress, only 10% had a degree in a STEM field. If you want to protect democracy you need to have Congress members and staff who are well-versed in technology. … To protect our democracy, we also need to ensure that there is always transparency and access to information – which is why we must fight

to protect net neutrality. Better safeguards are needed to protect against inaccurate information, as well as doctored videos and misinformation."

Serge Marelli, an IT professional based in Luxembourg who works on and with the net, wrote, "Fake news is overpowering people's attention, and it is becoming more difficult for real, factual news ('truth') to reach people. People chose to give fake news more credit; they somehow choose to distrust the 'official,' the 'old-media' institutions, just like they give credit to too many conspiracy theories, failing to recognise where the 'truth' actually is. Technology cannot replace a good, critical education and an astute mind, and the Dunning-Kruger effect [people's tendency to believe their cognitive ability is greater than it is] is powerful. Technology is a tool. It can, it could be used in a positive manner to strengthen most aspects of democracy and for citizens, using their democratic rights. For instance, citizens might be better informed; they might get a more complete access to information. Use of computers and computer networks might make it possible for people in remote locations to vote, or they might make counting votes more efficient and faster. It can also be used in a negative way that weakens the use of citizens' democratic powers. Most recent news tends to show that the negative outweighs the positive."

An expert in social informatics based in Denmark predicted, "Representative democratic institutions will remain mostly under control of elites and become increasingly irrelevant. Citizens will exercise democracy through ad hoc social movements coordinated online. Economic coordination will shift toward cryptocurrencies, making state-sponsored money less important."

Benjamin Shestakofsky, a University of Pennsylvania professor and researcher focused on the impact of digital life on labor and employment wrote, "The future of democratic institutions will depend on the willingness and ability of legislators and regulators to protect them from the monopoly power of tech companies."

Amali De Silva-Mitchell, a futurist and consultant participating in multistakeholder, global internet governance processes, commented, "There is great opportunity; how it is managed is where the risks are. Freedom of expression for all is critical for good democracy, judgment, decision-making and effective public transparency. Care has to be taken in regard to skewing of data responses and associated analysis, fake data and the other issues now commonly discussed transparently."

Art Brodsky, a self-employed consultant, said, "We should shut down social media for 90 days before an election. The forces of corrupting disruption overwhelm the ability of civil discourse to keep up. Some play by the rules, others don't, and there's no means of enforcement. Facebook, Twitter, etc., have grown far beyond their ability to detect, much less bar, bad actors."

Christian Schoon, external foresight consultant at Future Impacts, based in Germany, expressed hope that there will be change by the 2030s, writing, “Established democracies are very stolid. Political or systematical innovations in those bureaucracies need a lot of time to become mainstream. Furthermore, digital and technology innovations are too fast for those established systems. Those technology and digital innovations are driven by economic interests. The core logic is to maximize financial growth. Political and economic leaders generally think in short-term horizons when making decisions. If they would take a long-term perspective, they might see challenges they could solve today. The next decade will be a time of learning for political systems. After 2030/2035, democratic systems will have a comeback with participative, inclusive and core democratic solutions based on an ethical application of technology and artificial intelligence. One driving factor will be the vast gap between the poor and the rich, between well- and less-educated societal groups or between migrants and original populations or established immigrants."

Donald Codling, a consultant in international cybersecurity and internet policy who previously worked for the FBI for 23 years, wrote, “Given centuries of contentious human nature with the ‘modern’ version of tribalism embedding itself among many communities worldwide and the unsurprising conflicts that will inevitably arise from these tensions, plans must be made by society to deploy trained observers and vetted/trusted monitoring technologies to notice and respond to attempts to alter the collective will of the people. Assuming, of course, that humans will be able to ‘trust’ what they see, hear and read 10 years from now – the technology disinformation/deepfake ‘Catch 22’ is here!”

Milton Mueller, professor of internet policy, Georgia Tech, governance expert, warned that regulation is a double-edged sword, writing, “Social media is controversial in part precisely because it does increase and broaden communication and representation of different views. It is possible that reasonable modifications in laws, policies and technology will deal with some of the abuses of social media over the next 10 years. It is also possible, however, that techlash will result in more censorship and restrictions on speech that will undermine democracy.”

Banning Garrett, an independent consultant and futurist, said, “2030 is a decade away and much will change in the meantime, including both technology (capabilities, regulations, impact) and politics, which is changing at an exponential rate. The current impact of authoritarianism, populism and nationalism is already generating a strong backlash that could lead to a paradigm shift in politics, while the tech companies and regulators may find ways to diminish the impact of bad actors.”

Alex Simonelis, a professor of computer science at a university based in Canada, said, “I’m optimistic, and I recognize that my optimism may turn out to be wrong. I assume and hope that

the tech corporations will be regulated – e.g., repeal Communications Decency Act section 230 so they can be sued when they misbehave."

A postdoctoral scholar studying the relationship between governance, public policy and computer systems said, "In order to realize the benefits while managing the risks, it is important that policymakers establish rules that work to support democratic interests and limit incentive structures that work to entrench existing power dynamics. Regulation is critical to establishing public trust. Technology holds great promise in increasing democratic representation, bringing the ability to scale contact between governments and citizens and enabling individual-level provisioning of services as well as easier communication and collaboration between representatives and those they represent. By 2030, governments will have had the opportunity to reap the benefits not just of computerization, but of connectivity and the internet in understanding the needs and desires of their citizens and provisioning policy and services in response.

Rick Lane, a future-of-work strategist and consultant, wrote, "The question for the tech community is do they want help make the internet safe, secure and sustainable for all or do they just want to bury their heads in the sand? For our democracy and democratic institutions, the status quo is not acceptable. There were those of us in the early days of social networks who tried to create ethical and community standards. That effort was completely rejected by Facebook, YouTube and others. Some of us saw that we were given a great opportunity with the Section 230 immunity protections to create a better social networking and internet environment. Others wanted to 'move fast and break things' or argue that 'we are just online platforms and thus not responsible for what happens on our sites.' Well, we have seen the outcome of those actions on our democratic institutions and democracy, which is why I am a strong advocate for amending Section 230 to get it back to its original purpose. Although the voices around amending Section 230 are getting louder and louder, there is a concerted effort by Google, Facebook, Twitter, NetChoice, the Internet Association, Engine, CCIA and other groups to try to confuse the issue. If they are successful, then our democratic institutions and the future of our U.S. democracy will be put at risk. But history is on our side and changes will be made (see FOSTA-SESTA legislation)."

Assisting reforms: Pro-democracy governance solutions will be aided by the spread of technology and innovations like artificial intelligence. Those will work in favor of trusted free speech and greater citizen empowerment

Kenneth A. Grady, adjunct professor and affiliate of the Center for Legal Innovation, Michigan State University, commented, "Democracy will become more transparent as technology advances. Citizens will have greater insight into the actions and omissions of elected representatives. They

also will be able to see the effects of actions and omissions across a broader swath of society. These changes will come from greater access to data and from new tools that will analyze and present the data in ways that make it more available to citizens."

Osvaldo Larancuent, a professor based in the Dominican Republic with expertise in the governance of cyberspace, said, "The fundamentals of democracy will change as more citizens will demand more commitment and responsibility from governments, using digital tools and platforms that will allow better monitoring of their execution. What aspects of essential democratic institutions will change? The transparency of promises, public policies and execution of goals, and the improvement of governance based on social inclusion and crowdsourced participation enabled by specialized digital platforms. What role will technology play in whatever changes take place? More smart participation of communities in different aspects of democracy, promoting social inclusion and, via the evolution of social media networks, digital platforms to allow a more granulate participation in the institutions. More information available, and better monitoring of results achieved."

Joshua New, senior policy analyst at the Center for Data Innovation at the Information Technology and Innovation Foundation, said, "Technology has the potential to massively increase the responsiveness and participatory nature of government, leading to a more informed and engaged citizen population. The many concerns that people have about the impact about technology on democracy – misinformation, deleterious effects of social media, and so on – are neither fundamentally technological problems nor are they inevitable."

Terri Horton, workforce futurist with FuturePath LLC, wrote, "Broad access to artificial intelligence systems and advanced technologies across society can facilitate the democratization of civic innovation by 2030. Particularly, civic innovation aimed at solving some of the most complex social challenges related to work and employability may mitigate the impact of artificial intelligence and automation on people, reimagined careers and the future of work."

Kenneth Cukier, senior editor at The Economist and coauthor of "Big Data," commented, "We are starting to see incredible civic action, public deliberative forums and public voting on budgets on the municipal level all based around digital technologies. These will increase. No matter how appalling governance is at the national level, and inept at the international level, we will see a revival of good governance at the local level in large part by technologies that let people express themselves, be in dialogue with others and monitor and track government activities."

Yves Mathieu, co-director, Missions Publiques, Paris, France, responded, "There are great chances that more transparency will create more dialogues between elected citizens and voters,

between elections. The elected citizens will not have the possibility anymore to vote for their constituency without having an interaction prior to the vote or the decision process. The work of the elected persons will be totally changed."

Stephen Abram, managing principal, Lighthouse Consulting, wrote, "I see the two polarities. I see the U.S. doing little to deal with their election interference by foreign actors. On the other hand, other countries outside of the G20 are having their public discourse democratized and opening up criticism of poor or bad governments. On the whole, on a global basis I think technology is a force for good. If I had to answer the question from a strictly U.S.-centric point of view, I'd say for the period through 2030 we will see a steady weakening of democracy as foreign actors, the Supreme Court, etc. weaken rights and public discourse."

Harold Feld, senior vice president at Public Knowledge, said, "I expect technology to continue to reshape how democratic institutions and civic engagement work. What we have seen in recent years has been similar to other stages of evolution of services over the internet. Bad actors learn how to manipulate systems based on trust and user ignorance. But we are already seeing successful pushback. Overall, I expect use of technology to continue to improve civic engagement."

A longtime engineer and architect for several of the world's foremost technology companies said, "Democracy will move online, just as so many other aspects of life – from shopping to banking to doctor's visits to education to renewing a driver's license – have done. Voter suppression based on economic and geographical limits will become ineffective. Yes, online voting presents the risk of electronic vote tampering, but it's also an opportunity for transparency and security."

Jon Lebkowsky, CEO, founder and digital strategist, Polycot Associates, wrote, "It's tempting to say that technology will weaken democracy, based on current events. However, I'd rather speak to the potential, which is that intelligent and effective use of technologies to inform the electorate and support civic debate could make democracy stronger. We have a lot of work ahead for this to be the case, and we probably have to rethink the case for 'social media' as it stands today."

Greg Shatan, a lawyer with Moses & Singer LLP and self-described 'internet governance wonk,' wrote, "I believe the capacity for technology to improve the ability to obtain information, to vote, to express yourself and to engage with others is largely positive and will come in 'off-web' ways that use the internet as a means of carriage. That said, we are in a difficult place with regard to misinformation, radicalization and manipulation using the web, particularly social media. The values of free speech tolerance are being tested even as 'free speech' is being co-opted … for purposes of intolerance."

Richard Culatta, CEO of ISTE and a futurist and consultant, suggested, "If we continue down our current path, democracy will be eroded through digital misinformation campaigns and technology that reinforces our existing viewpoints by limiting exposure to ideas that are different from our own. However, I'm optimistic that we can still change this outcome by starting a national conversation to redefine digital citizenship and actively model the use of technology to rebuild democracy."

A senior lecturer in computer science wrote, "I expect significant improvements over the next decade, mostly in countries where democratic institutions are weaker. We can see some of this effect occurring in notoriously undemocratic countries even now, as authoritarians make concessions to popular demands, concessions that would have been unthinkable decades ago. Although technology has harmed advanced democracies like the U.S., these harms so far have been relatively mild by comparison."

An anonymous respondent commented, "On the global scale, technology will overall increase the democratic involvement and reach of citizens, especially in the developing world as increased globalization and involvement from key players like the U.S. and EU nations encourage transparency."

Jim Cashel, author of "The Great Connecting: The Emergence of Global Broadband and How That Changes Everything," said, "In the U.S., internet technologies will both strengthen and weaken democratic institutions over the next decade. From a global perspective, however, internet technologies will greatly strengthen democratic institutions. Three billion people globally currently have no internet – but soon will. Internet satellite and other technologies will be blanketing the planet in broadband in the next few years. For those that until now have had no voice whatsoever, the arrival of the internet will be transformative."

A professor of digital culture based in Nigeria said, "New media technologies are gradually transforming political cultures and promoting some tenets of good governance such as accountability, transparency, participatory democracy and credible electoral process. My studies on the use of technology in Nigerian democratic practice have shown that democratic institutions in the Global South may be significantly affected in new ways by technology in the next few years. For instance, the emergence and use of new media in 2011, 2015 and 2019 electoral cycles in Nigeria have significantly increased. Political actors, candidates, political parties, state actors, nongovernmental organisations and private citizens are increasingly relying on social media platforms and other mobile technologies to amplify their voices, sell their policies and mobilise support, and engage with elected leaders. The electoral-management office has also been using new technologies for education, information and mobilisation. Of course, these positive results are

not without some of the downside of technologies in democratic practice. Instances of false alarms, hate speech and flaming conversations are promoted through unmoderated online platforms. But, to my mind, technologies have done more good than harm to the development of democratic practice."

Tomslin Samme-Nlar, consultant in technology security and policy based in Cameroon, wrote, "Citizens and civil society will try to use technology to improve debate on issues and to inform more citizens about issues. Technology will be used more and more to express dissenting views on government policy positions. And governments and politicians will look for and attempt to use innovative uses of technology to suppress dissent and promote propaganda."

Ellery Biddle, an advocacy director for Global Voices whose specialty is protection of online speech and fundamental digital rights, said, "I suspect that in spite of all the negative effects of networked technologies on democracy and democratic institutions and norms worldwide, access to networked technologies is still having a net positive effect on peoples' abilities to engage with democratic institutions and processes. As a person who works primarily on these issues in the Global South, the issue of disinformation is hardly new to me, and the potential for companies like Facebook to manipulate information and enable state actors to manipulate information at a large scale is not novel either. But when I look at parts of the world where access to technology is still rising and has yet to plateau, I am constantly reminded of how big of a game changer these tools can be, despite their limitations. Last week, a colleague in Ethiopia (who is a well-known civil society activist) tweeted a positive message about LGBT pride. He got a few hundred responses, most of which were negative, but some were not. Another colleague swiftly pointed out that this, in spite of the vitriol it triggered, was a sign of real progress for online discussion of LGBT issues in Ethiopia. Before, she noted, you could not even speak of it. In many parts of the world, the internet is still enabling speech and engagement in ways that are literally not possible in 'real life' public spaces. In my view, this is where democracy begins. So, I have some hope."

John Carr, a leading global expert on young people's use of digital technologies, a former vice president of MySpace, commented, "The internet is likely to improve our democratic processes running up to 2030, but only because I believe things are currently so bad they are bound to improve. Democratic legislatures around the world simply will not tolerate or allow there to be any reasonable doubt about the legitimacy of the outcome of those processes which form the cornerstone of how we live, namely elections and referenda. The 'foundation stories' of a great many countries frequently turn on how its people won universal suffrage and the right to determine their own affairs free of the influence of an imperial or foreign power. Silicon Valley right now looks like a foreign imperial power in a great many jurisdictions."

Kevin Carson, an independent scholar on issues of post-capitalist and post-state transition, wrote, "Networked communications will continue reinforcing the trend toward self-organized, horizontalist movements and the proliferation of access to alternative news outside traditional gatekeeping institutions, as well as toward distrust of traditional leaders. It's true that in recent years the right (especially alt-right offshoots from GamerGate) has seen part of the benefit from these trends, alongside horizontalist movements of the left like Occupy, Black Lives Matter, #NoDAPL and the various municipalist movements in Barcelona, et al. But I am hopeful that … we'll see a real tipping point in the next decade, and governance will become more open."

Eric Vance, director, Laboratory for Interdisciplinary Statistical Analysis, University of Colorado-Boulder, commented, "With the advent of blockchain-like security, we should be able to vote via internet or sign petitions that way or make comments to be entered into the public record. These things will help strengthen democracy."

Herbert Gintis, external professor, Santa Fe Institute, and professor of economics, Central European University, said, "New technology will advance science and expose corruption and bigotry."

Thierry Gaudin, cofounder and president, France 2100 Foundation, wrote, "The internet develops and widens the information of the citizen at local, national and international levels. Therefore, awareness is increased. Local democracy will benefit, as will concern of citizens regarding environmental and planetary issues. Up to now, democracy has functioned through elections of representatives. Only in rare cases, votes have been used to approve or disapprove a project. Webocracy allows public consultations on projects and that might bypass some corruption. The web may also contribute to the revival of local cultures and traditions."

Tim Bray, well-known technology leader who has worked for Amazon, Google and Sun Microsystems, wrote, "Our societal and online ugliness is a phase that we can transcend and indeed will be forced to in order to pull together and survive the devastation wrought by the climate crisis. Whereas most of us would do anything to stave off the worst effects, some of those effects have become unavoidable, and the pain will be only slightly ameliorated by knowledge that the crisis is a forcing function that will require that we learn to distinguish real science-backed news from fake charlatanry, in the face of existential threat."

Ibon Zugasti, futurist, strategist and director, Prospektiker, wrote, "If technology is used in the right way, it will contribute to a better monitoring and control of public policies by civil society."

Frank Feather, president, AI-Future, said, "Elections will and should be conducted electronically, online. Public opinions will be sought through online surveys, not just in general but by way of consultation about prospective legislation. However, such a democratic online platform must be 100% secure in terms of data, shared opinions and privacy. Anyone caught tampering with such a system should be severely punished."

David Wilkins, instructor of computer science, University of Oregon, said, "The internet gives a voice to those ignored by a well-educated media who have massive implicit biases against any who are significantly less formally educated."

John Paschoud, elected politician of the Lewisham Council (a London borough), wrote, "Technologies (e-voting, e-referenda, managed social media and e-fora) will enable more people to participate in a meaningful and thoughtful way. But some technologies (which make it *too* easy to influence democratic representatives or encourage thinking that all issues are best decided by a simple majority vote) may either be regulated, or will be dealt with in more automated ways by elected representatives, thus nullifying the advantage they seem to offer."

Frederico Links, a journalist, governance researcher and activist based in Africa, said, "Technology, specifically communications tech, has already significantly changed democratic practice and institutions, both positively and negatively. This mixed effect will only continue to play out over the decade to 2030, especially in still-emergent democracies and transitional societies. In some the effect could be more good than bad; in others it could be more bad than good. What is definitely happening everywhere is that people are more and more using the technologies, such as social media platforms, to find their voice and express themselves. As the tech becomes ever more pervasive, especially in developing societies, there will be disruptions to vertical power structures, which could lead to destabilisation of some societies, and could lead to increased democracy in others. On the whole, I think it leans more to the positive, as the pressures are many on state authorities everywhere to become more responsive and accountable, while everywhere there appears to be a tech-mediated awakening of political consciousness, which I don't think will be quelled or repressed, despite the best efforts of many authoritarian-minded actors also trying to use the tech to attempt mass control and manipulation."

Stephan G. Humer, lecturer expert in digital life, Hochschule Fresenius University of Applied Sciences, Berlin, commented, "Empowerment of people will be stronger than the negative aspects. In terms of educational impact alone, the internet will be more positive than negative. Online learning will be much more positive, with more possibilities for everyone."

Scott Burleigh, principal engineer at a major U.S. agency, said, "Technology is likely to strengthen democratic institutions by providing voters with more information and eventually making it easier to participate in elections, possibly increasing turnout. I don't think this is necessarily a good thing, as it will make it easier for misinformed voters to swing elections in ways that are not constructive. But there has never been any guarantee that strengthening democratic institutions will, in itself, strengthen society."

Kevin Doyle Jones, cofounder, GatherLab, which convenes visionary people looking to transform climate, communities and capital for good, said, "Collective action is necessary for us to respond effectively to climate change, across neighborhoods. I have more hope of that bubbling up from cities to the state governments and I hope even the federal governments. Watersheds and foodsheds and economic biospheres are key, and to keep the good from being the enclave of the few, with water-poor shantytowns outside for the others, we will need to understand and act on the protocols of neighborliness. See https://solutions.sphaera.world/building-blocks/walter-brueggmann-on-neighborliness."

An anonymous respondent commented, "The internet essentially constitutes the essence of true democracy – a free world where people of any tribe, color, poor or rich, young or old can express their hearts and minds unreservedly, unstoppably. Every aspect of our social, political, economic and cultural activities is well captured and represented in the internet. … With the internet, democracy has been exposed and questioned of its true essence to address and meet the expectations of social need. There has never been any good concept that could not be perverted for the wrong, mischievous, selfish purpose, and the internet is not immune to such damaging activities. What this will foster is a technological commitment to thwarting those negative forces and restoring the internet to its rightful place in our society. This should constitute the commitment of the next decade in the use of the internet."

Andrea Romaoli Garcia, an international tax lawyer actively involved with multistakeholder activities of the International Telecommunication Union and Internet Society, wrote, "The fourth industrial revolution will inaugurate a sixth dimension of human rights and introduce technologies that will impact human evolution in all fields. There will be a new model of democracy: neo-constructivist democracy. The new, hyperconnected consumerist society will actively work to establish and monitor ethical standards that will strengthen the pillars of democracy."

Prateek Raj, assistant professor in strategy, Indian Institute of Management, Bangalore, an economics expert, wrote, "Technology cannot be studied independently without considering the concentration of power. Of course, technology has had profoundly positive effects on civic activism in many parts of the world. It is bringing about a major transformation in governance in developed

countries like India by making essential government services more accessible. However, we live in a world of digital monopolies where a large chunk of information is being funneled through a few, like Google and Facebook. These organizations are primarily driven by advertising revenue and aim to maximize user engagement. To achieve these, their algorithms can prioritize visceral content (e.g., YouTube suggestions), over content of public interest. Even encrypted platforms like WhatsApp have been notoriously associated with the spread of rumors, hate and misinformation, which is closely linked to their design architecture, which allows easy formation of large groups. There is a need to relook at the algorithms and architecture used by these digital giants, so the internet can fulfill its positive social purpose. … As the public and regulators wake up to the harms of these platforms, we can expect timely steps."

An anonymous respondent wrote, "Yes, the internet will be used to violate human rights and commit atrocities. But it will and does also enable humanity to connect and grow as never before. It is a new form of adversity that humanity must rise and adapt to."

A vice president and strategist for a company that manages crisis operations wrote, "All signs today highlight the fraying effect that social media technologies in particular have had – and are having – on social cohesion and democratic discourse. We are seeing growing pressure on governments to intervene, and key pioneers of these technologies expressing dismay for the effects they are having. … It is reasonable to expect that we will see considerable advances over the next 10 years to address the negative effects of Web 2.0."

The leader of an innovation group at one of the world's top five technology organizations wrote, "For democracy to survive, we must figure out how to bring transparency and accountability while also preventing tyrannical control. This will require deep changes to the ways we build and deploy technology."

Anonymous respondents commented:

- "By 2030 we will see more open democracies around the world and technology will continue to evolve to deliver more and more services to citizens (i.e., e-health, smart cities, smart water)."
- "A wide range of both official and unofficial transparency and open-government initiatives will make information about the activities of government more open than ever before."
- "Many political parties will struggle with no longer being a default intermediary, and this poses difficulties with maintaining a single unified and coherent policy platform; in democracies with a relatively small number of major parties, this may be a seismic shift."
- "The biggest role technology will play will be to increasingly provide a catalytic surface for people sharing a perspective to find each other and begin working together."

- "I hope democracy in 2030 will feature a clearer understanding of what citizens want from their government, individually and collectively."
- "Decision-making by essential democratic institutions, and attribution to the individuals who are involved in making those decisions, should become more transparent with the availability of social media."
- "I expect more real-time, responsive engagement from government, community leaders and citizens through digital media, more virtual attendance at community board meetings and Parent Teacher Association gatherings, simultaneous-translation capacities and symbolic voting/polling to gauge direction if not investment in local government."
- "The ability to meet people virtually and to hear their voices will vastly expand the opportunities for cross-border collaborative efforts and empathy that was simply not possible in a previous age."

5. Tech will have mixed effects that are not possible to guess now; some expect little change

When asked about how people's uses of technology will affect core aspects of democracy in the next decade about 18% of the experts responding to this canvassing said they will not affect much change in core aspects of democracy and democratic representation.

Fred Baker, board member of the Internet Systems Consortium and longtime leader in IETF and ICANN, wrote, "I say that the net change will be small in the coming decade and a half primarily because I expect to see both improvements and retrograde behavior; the sum is close to zero."

Evan Selinger, professor of philosophy, Rochester Institute of Technology, said, "I'm not sure how anyone can make a credible prediction. First, momentum from the techlash hasn't resulted in a tipping point. It's unclear whether momentum for real change is slowly building or resignation and cynicism have become more deeply entrenched. Second, it's still too early to know what the long-term consequences will be of the General Data Protection Regulation. Third, new challenges like deepfakes are springing up, and they serve as a reminder that the speed of innovation has an edge over the slower changing horizon of regulation. Fourth, politics matter! Whether or not Trump gets re-elected will have a major impact on what democracy looks like in 2030, and not only in the United States. Fifth, we're living through a moment where leading experts are struggling to come to terms with the disruptive potential of artificial intelligence. If using AI products and services helps authoritarian governments further eviscerate personal and collective liberties, will democratic ones get nudged closer to authoritarianism themselves?"

Mike Roberts, Internet Hall of Fame member and pioneer CEO of ICANN, said, "Among the effects of the internet on social discourse are 1) amplification of voices (often without enough thought behind them); and 2) a speeding-up of the action-reaction dimension of expression. We are currently in a phase of reaction to having allowed too much power to accrue to social media platforms. Consensus on remedies is difficult to achieve because of the factors noted above, and also because the problem itself is difficult to deal with. Perhaps the single most difficult aspect is moderation, i.e., censorship of expression – how far is too far, etc. We are lucky that the big platforms evolved in the U.S., with our history of First Amendment protections. So, bottom line, there will be a lot of noise, especially from politicians, not many solutions and not much overall movement."

John Battelle, cofounder and CEO, Recount Media, and editor-in-chief and CEO, NewCo., commented, "We have a lot to work through as a society before we can fully understand and embrace the potential of the technologies we've created. Ten years seems like a long time, but 10

years ago, Facebook had not yet unleashed advertising in the News Feed, and the smartphone remained a luxury for the wealthy. Android was in its first two versions. Plus, democracy takes generations to significantly morph. The two forces, tech and politics, are now inextricably linked. We'll need more than 10 years to figure out what that means."

Alan Inouye, senior director for public policy and government for the American Library Association, said, "I expect multiple forces that net to an indeterminate state. The positives of technology: Increasingly easier for people to obtain relevant information and participate in political discussions and democratic institutions. Elected officials and intermediaries are better able to reach out to people to obtain their views. Innovations such as remote testimony at Congressional hearings. The negatives of technology: Continuing tribalization by political ideology and views. Easier participation but also shallower participation – 'just click here' may replace some real or potential substantive political engagement. Increasing competition for people's attention, with democracy and politics on the losing end. Debate of Democratic presidential candidates versus 'Game of Thrones' (or just everything else on the internet). What will people watch in 2030?"

Charis Thompson, professor of sociology, London School of Economics, and member of the World Economic Forum's Global Technology Council on Technology, Values, and Policy, wrote, "Substantive democracy requires ethos, logos and pathos, but we are giving up on shared ethos (affective and climate and other polarization) and logos (post-truth, deepfakes) and ceding superb – much better than human – rationality to artificial intelligence and machine learning (for the good as well as the bad) and that is leaving us only with pathos for politics, whether of the bully populist kind or the neoliberal kind or the anti-nation-state kind. What alternatives do we have to liberal democracy that fit our emerging tech, and inclusion/inequality and climate crises better? Are there ways to save/promote substantive democracy and if so, who do they benefit and who do they leave out?"

An American state senator wrote, "The answer depends on the next election. Despite gerrymandering, despite current manipulation, despite Citizens United, despite foreign intervention, will the proponents of democracy be able to take back control? If so, then we have a chance of continuing to work toward the American ideal of one person, one vote. We will have the opportunity to build artificial intelligence based on those values. If the incumbent and cohort retain power, without check, increasing gerrymandering, destroying the public school system that enables the poor to rise, continuing to increase the delta between rich and poor so that we have the servant class, the homeless class, the nobility class of professionals and the ruling class, then the American ideal is gone. I do not believe we will have another opportunity to save it after Nov. 3 of 2020."

An anonymous respondent said, "I see three threads relevant to this discussion. 1) The very real threat of hacking and related cybersecurity issues. Manipulation of results is a concern. Might election results someday be held hostage by ransomware? This is a problem inherent in the technology and the solution is technological. 2) Monopolistic control and/or censorship of information. This already exists in China. In the U.S. there are many, messy, conflicting voices online in our democracy, as there should be. The bigger problems are affirmation bias and the fact that lies are made to seem real by instant popular acclaim. Our attention span is short. Fact-checking that comes hours after the lie does not erase the lie. On the plus side is 3) the tremendous, creative innovations appearing every day, including those that enhance communication."

Joshua Hatch, a journalist who covers technology issues, said, "The ability to connect with other citizens, to gain access to information and to connect with social/political leaders will likely be offset by disinformation/misinformation, deepfakes, the digital divide, etc. … So, what might democracy look like in 2030? I could imagine more direct connection to elected officials. Better ways of taking the pulse of the citizenry on a regular basis (not just through elections). But with that comes more opportunity to distort what public servants think the public believes. Perhaps we'll see a bit more direct democracy. Perhaps we'll also see more direct communication between civic and political leaders and the public through new technologies and platforms. But such developments may also increase the risk of bad actors seeking to interfere with the public sphere."

Gry Hasselbalch, cofounder of DataEthicsEU, wrote, "Our technological environment holds the potential for both – a weakening or a strengthening of democracy. Basically, this depends on how conflicts between different interests in technology development are resolved today. Which interests will dominate over others in the design standards, the laws, education and culture of technology development? Commercial interests in profiting from data intensive technologies? States' interests in technological control and efficiency? Or the human interest in terms of agency, self-determination and dignity? The answer to this question will shape technological design, business models and their interaction with our world in the future. It depends on technical, design practices, legal, economic and cultural processes that support a human centric distribution of powers. I am optimistic because I see a social movement of change and action. Across the globe, we're seeing a cultural shift and a technological and legal development that increasingly places the human at the center. The European General Data Protection Regulation is a great example of this shift as well as new citizen privacy concerns and practices such as the rise of use of ad blockers, privacy enhancing services, etc."

Alan Mutter, a consultant and former Silicon Valley CEO, commented, "Depending on how politics, economics, climate change and other macro events play out, technology will change

everything or nothing. Information technology has acted as an accelerator of both information and misinformation. If evil forces hijack and dominate the conversation, then technology will make things worse than they otherwise might have been (see Trump promotion of racist tropes). If the world comes to its senses and dumps Trump and others of his craven ilk, then technology potentially could speed an era of enlightenment. The outcome will be determined by the ballot box, not the black box."

Robert Cannon, senior counsel for a U.S. government agency and founder of Cybertelecom, a not-for-profit educational project focused on internet law and policy, said, "We live in a time of disruption. The economy is going through a major revolution from the industrial economy to the information economy. In times of uncertainty and displacement, anxiety grows leading to tribalism (us versus them). Jobs are shifting – concentrations of wealth are shifting – therefore blame the (fill in the blank). People want something to blame or something to hate. Anything that is other or suspicious gets blamed regardless of any causal connection. The current political climate is a reflection of that anxiety. Old-economy markets are getting disrupted while the new economy grows. On the whole, the economy is strong, but it is not evenly divided. In the end, has technology played an ever-increasing role in democratic discourse? Of course it has. We have had misinformation campaigns that were received on fertile ground. People believed bullshit because they wanted to believe bullshit – not because technology caused them to believe bullshit. Meanwhile, on YouTube a new influencer has emerged presenting incredible presentations of history. Community organizations from animal rescue to immigration assistance are better networked than ever. During the federal government shutdown, community organizations coordinated over social media, distributing support to families in need. Coverage of local news and local government has matured, taking over the void left when mainstream media left the space. Cycling subcommunities have formed, and influencers review products, produce training content and cover the latest race news. Dingo-rescue organizations in Australia are receiving support from individuals all around the world."

Hans J. Scholl, professor, The Information School, University of Washington, commented, "In democratic societies, abuses like the interference with elections (direct or indirect) have happened and will happen again. However, the learning curve of populations and governments in dealing with and uncovering these abuses will increase, and, with that, the impact will be lessened. In authoritarian systems, individual surveillance will increase and be perfected (via artificial intelligence, the Internet of Things, etc.), while despite those mechanisms, people will always find ways of circumnavigation. Distributed ledger technologies like blockchain might help track voting and government transactions in ways that make them unfalsifiable, leading to more trust, better transparency and accountability. In a nutshell, can (or even will) each new foundational

technology pose new challenges? Yes. Will that fundamentally change the trajectory of a society from democratic to authoritarian, or vice versa? No."

Lawrence Wilkinson, chairman at Heminge & Condell and founding president of Global Business Network, the pioneering scenario-planning futures group, wrote, "While tech has distorted civil discourse and challenged (incumbent) democratic norms, it has also reinforced and amplified many of those same institutions/processes. As we learn our way, as a society, into the use of these new technologies, their impact should be felt to be moderate – should be 'absorbed' into our democratic norms/institutions, which will feel consistent with their legacy, even if they are, in fact, materially modified by new tech (as was the case with the telegraph, the radio, then television). Civil society will be different in ways that don't feel different."

Judith Donath's two scenarios

Judith Donath, a fellow at Harvard's Berkman-Klein Center currently writing a book about technology, trust and deception and the founder of the Sociable Media Group at the MIT Media Lab, chose not to select any of the three possible choices offered in this canvassing, instead sharing two possible scenarios for 2030 and beyond. She wrote:

> **Scenario #1:** Democracy is in tatters. The rise of authoritarianism is worldwide, triggered by rapid social change and stoked by fear of immigrants, of the vast refugee populations, fleeing war and famine (due ultimately to overpopulation and environmental degradation, including but not limited to climate change). Surveillance technology aids repressive governments. News is abundant but unreliable, often exquisitely tailored to persuade, anger or confuse. Automation has eliminated numerous jobs and joining some form of militia (whether government army, street gang or terrorist organization) is the main alternative.
>
> In the big picture, unemployment, overpopulation and environmental degradation — the ultimate causes of this turn toward repression — are disasters we created with technology. The extraordinary technological developments of the last several centuries were accompanied by, and inextricable from, political and moral philosophies which included the belief that everything on earth exists for the use and exploitation of humans, that growth is good and wealth is the goal.
>
> Yet in an immediate sense, this is not a scenario that has been brought about or relies on technology. The turn toward authoritarianism, fear of outsiders, etc. is an ancient response. Yes, repression is aided by surveillance — but there have been plenty of

repressive regimes predating contemporary panoptic technologies. Nor has it been caused by disinformation campaigns — though they may well have tipped crucial elections, it is only with a receptive, i.e., angry and fearful, population that they can succeed.

But let's look at another scenario.

Scenario #2: Post-capitalist democracy prevails. Fairness and equal opportunity are recognized to benefit all. The wealth from automation is shared among the whole population. Investments in education foster critical thinking, and artistic, scientific and technological creativity. New economic models favor sustainability over growth. Radical infrastructure changes reduce human environmental footprint: e.g., eliminating private cars vastly reduces percentage of earth's surface that is paved plummets. New voting methods increasingly feature direct democracy – AI translates voter preferences into policy.

What would it take to move seriously in this direction? It's a revolutionary scenario, one that requires moving beyond capitalism and the assumption that growth is inherently good. Yet this change is arguably necessary: Our exploitive relationship with the world around us has brought us and the other inhabitants of this planet to the brink of extinction. While essential, it would entail tremendous political and social change, which I am doubtful will happen. But let's look at what could help.

Short term: While, as I said, I don't think disinformation campaigns are the cause of our current political problem, they can tip key elections. And, unreliability confuses people, and even the most well-intentioned just learn to tune out. So, battling fake news, etc., is key. One reasonably easy fix is for Facebook and other newsfeed aggregators to make seeing the *source* of a news article or video a prominent and hard-to-detach part of the viewing experience. Another is better interfaces for discussion and moderation.

Longer term: One problem facing democracy in America is that we are far from a situation where government is by and for the people and where each citizen's vote counts as much as any other's. The sources of this problem include the electoral college and Senate, which give citizens in rural states far greater influence per vote than residents of populous states; Citizens United and many other ways in which corporate interests have an overwhelmingly powerful voice in governing, and the inherent problems of representation, where we vote for people, not policies. The last is an issue that contemporary technology could address – can we create a government system in which

people vote for policies and outcomes they want, and the government consists of people, aided by machines, who figure out how, within Constitutional boundaries, to fulfill these goals?

A note on automation: We have a looming unemployment crisis directly caused by technology — but only because of how we have chosen to structure work and profit. Automation should be a tremendous boon to workers, making everyone better off, not a nightmare of unemployment, homelessness and hopelessness. In addition to revising how we distribute the benefits of automation we need to rethink the meaning of work. One meaning of work is the job you go to make money, to be compensated for doing something you would not otherwise choose to do. But there is also the meaning of work as in artistic, personal work — we say of some artists and writers that the held a day job and then went home to do their *work*. Here, the word "work" is used to mean doing something meaningful. As more and more jobs are eliminated by automation, we need to ensure not only that people can still survive, still have food and shelter, but also that they have a place for ambition and accomplishment.

About this canvassing of experts

The expert predictions reported here about the impact of digital technologies on key aspects of democracy and democratic representation came in response to a set of questions asked by Pew Research Center and Elon University's Imagining the Internet Center in an online canvassing conducted between July 3, 2019, and Aug. 5, 2019. This is the 11th "Future of the Internet" canvassing the two organizations have conducted together. More than 10,000 experts and members of the interested public were invited to share their opinions on two questions: 1) the impact on democracy and democratic representation of uses of networked technologies in the next decade, and 2) the potential for significant social and civic digital innovation in the next decade accomplished in some significant way due to the application of technology. This report includes only the data tied to the first question. A second report that includes results from the second question will be released in the spring of 2020.

The results published here come from a nonscientific canvassing. They cover respondents' answers the following:

> ***Technology's impact on democratic institutions/representation:*** *People's uses of technology can impact the effectiveness of democratic institutions and processes. For instance, digital tools and platforms might contribute to users' political knowledge and ability to vote, speak and assemble. The way technology is used could also affect the actions of executive, legislative and judicial branches of government, the enforcement of the rule of law, the role of the press and the basic recognition of human rights.*
> ***The Question:*** *Between now and 2030 how will use of technology by citizens, civil society groups and governments affect core aspects of democracy and democratic representation? (Please choose only one answer):*
>
> - *Mostly strengthen core aspects of democracy and democratic representation.*
> - *Mostly weaken core aspects of democracy and democratic representation*
> - *Not much change core aspects of democracy and democratic representation*

Participants were further asked:

> ***Please explain:*** *What do you expect democracy to look like in 2030 from the perspective of citizens? What aspects of essential democratic institutions will change? What role will technology play in whatever changes take place? If you believe democratic institutions and processes are unlikely to be significantly*

affected in new ways by technology or other forces in the next decade, what do you think that means for society?

Answers of the 979 total responses to the quantitative question showed the following:

- 49% said use of technology will *mostly weaken core aspects of democracy and democratic representation in the next decade*
- 33% said use of technology will *mostly strengthen core aspects of democracy and democratic representation*
- 18% said there will be *no significant change* in the next decade

The web-based instrument was first sent directly to a list of targeted an international set of experts (primarily U.S-based) identified and accumulated by Pew Research Center and Elon University during previous "Future of the Internet" studies, as well as those identified in an earlier study of people who made predictions about the likely future of the internet between 1990 to 1995. Additional experts with proven interest in digital government, governance, social and civic innovation and other aspects of this particular research topic were also added to the list.

We invited a large number of professionals and policy people from government bodies and technology businesses, think tanks and interest networks (for instance, those that include professionals and academics in law, political science, economics, social and civic innovation, anthropology, sociology, psychology and communications); globally located people working with communications technologies in government positions; technologists and innovators; top universities' engineering/computer science and business/entrepreneurship faculty, graduate students and postgraduate researchers; plus many who are active in civil society organizations such as Association for Progressive Communications (APC), Electronic Privacy Information Center (EPIC) and Access Now; and those affiliated with newly emerging nonprofits and other research units examining the impacts of digital life.

Among those invited were researchers, developers and business leaders from leading global organizations, including Oxford, Cambridge, MIT, Stanford and Carnegie Mellon universities; Google, Microsoft, Akamai, BT and Cloudflare; leaders active in global internet governance and internet research activities, such as the Internet Engineering Task Force (IETF), Internet Corporation for Assigned Names and Numbers (ICANN), Internet Society (ISOC), International Telecommunications Union (ITU), Association of Internet Researchers (AoIR), and the Organization for Economic Cooperation and Development (OECD). Invitees were encouraged to share the survey link with others they believed would have an interest in participating, thus there may have been somewhat of a "snowball" effect as some invitees invited others to weigh in.

Since the data is based on a nonrandom sample, the results are not projectable to any population other than the individuals expressing their points of view in this sample.

> *The respondents' remarks reflect their personal positions and are not the positions of their employers; the descriptions of their leadership roles help identify their background and the locus of their expertise.*

A large number of the expert respondents elected to remain anonymous. Because people's level of expertise is an important element of their participation in the conversation, anonymous respondents were given the opportunity to share a description of their internet expertise or background, and this was noted, when available, in this report.

In this canvassing, 640 respondents answered the demographic questions. Some 75% identified themselves as being based in North America, while 25% hail from other corners of the world. When asked about their "primary area of interest," 33% identified themselves as professor/teacher; 14% as research scientists; 13% as futurists or consultants; 8% as technology developers or administrators; 8% as advocates or activist users; 6% as entrepreneurs or business leaders; 4% as pioneers or originators; and 15% specified their primary area of interest as "other."

Following is a list noting a selection of the key respondents who took credit for their responses in this canvassing. Workplaces are included to show expertise; they reflect the respondents' job titles and locations at the time of this canvassing.

Carlos Afonso, internet pioneer and digital rights leader based in Rio de Janeiro, Brazil; **Sam Adams,** 24-year veteran of IBM now senior research scientist in artificial intelligence for RTI International; **Jeffrey Alexander,** senior manager for innovation policy at RTI; **Karl Auerbach,** chief technology officer, InterWorking Labs; **Satish Babu,** founding director, International Centre for Free and Open Source Software; **Fred Baker,** board member of the Internet Systems Consortium; **John Battelle,** cofounder and CEO, Recount Media, and editor-in-chief and CEO, NewCo.; **Ellery Biddle,** advocacy director for Global Voices expert in protection of online speech and fundamental digital rights; **Bruce Bimber,** professor of political science, University of California-Santa Barbara; **danah boyd,** principal researcher, Microsoft Research, and founder of Data & Society; **Stowe Boyd,** consulting futurist expert in technological evolution; **Richard Bennett,** founder of the High-Tech Forum; **Philippe Blanchard,** founder of Futurous, an innovation consultancy based in Switzerland; **Daniel Berleant,** author of "The Human Race to the Future"; **David Bray**, executive director for the People-Centered Internet coalition; **Tim Bray,** well-known technology leader who has worked for Amazon, Google and Sun Microsystems; **Scott Burleigh,** principal engineer at a major U.S. agency; **Nigel Cameron,**

president emeritus, Center for Policy on Emerging Technologies; **Angela Campbell,** professor of law and co-director, Institute for Public Representation, Georgetown University; **Robert Cannon,** senior counsel for a U.S. government agency and founder of Cybertelecom; **Kathleen M. Carley,** director, Center for Computational Analysis of Social and Organizational Systems, Carnegie Mellon University; **John Carr,** a leading global expert on young people's use of digital technologies and former vice president of MySpace; **Jamais Cascio**, distinguished fellow at the Institute for the Future; **Carol Chetkovich,** professor emeritus of public policy at Mills College; **Eline Chivot,** a public-policy researcher at the Center for Data Innovation; **Alexander Cho,** digital media anthropologist and postdoctoral scholar expert in youth and social media at the University of California-Irvine; **Barry Chudakov**, founder and principal at Sertain Research; **Julie Cohen,** professor of law and technology, Georgetown University; **Sasha Costanza-Chock,** associate professor of civic media, Massachusetts Institute of Technology; **Kenneth Cukier,** senior editor at The Economist and coauthor of "Big Data"; **Judith Donath**, fellow at Harvard University's Berkman Klein Center for Internet & Society and founder of the Sociable Media Group at the MIT Media Lab; **Stephen Downes,** senior research officer for digital technologies, National Research Council of Canada; **Esther Dyson,** internet pioneer, journalist, entrepreneur and executive founder of Way to Wellville; **David Eaves,** public policy entrepreneur expert in information technology and government at Harvard's Kennedy School; **Emmanuel Edet,** legal adviser, National Information Technology Development Agency, Nigeria; **Robert Epstein,** senior research psychologist, American Institute for Behavioral Research and Technology; **Daniel Estrada,** digital humanities and ethics lecturer, New Jersey Institute of Technology; **Susan Etlinger**, industry analyst for Altimeter Group; **Harold Feld,** senior vice president at Public Knowledge; **Ayden Férdeline,** technology policy fellow, Mozilla Foundation; **Stephanie Fierman,** partner, Futureproof Strategies; **Seth Finkelstein**, consulting programmer and EFF Pioneer Award winner; **Charlie Firestone**, executive director and vice president, Aspen Institute Communications and Society program; **Richard Forno**, director, Center for Cybersecurity, University of Maryland, Baltimore County; **Marcus Foth,** professor of urban informatics, Queensland University of Technology; **Juan Ortiz Freuler,** policy fellow, World Wide Web Foundation; **Thomas Frey,** founder and senior futurist, DaVinci Institute; **Rob Frieden,** professor of telecommunications law at Penn State, previously worked with Motorola and held senior policy positions at the Federal Communications Commission and the U.S. National Telecommunications and Information Administration; **Oscar Gandy**, professor emeritus of communication at the University of Pennsylvania; **James Gannon,** cybersecurity and internet governance expert based in Europe; **Marshall Ganz,** senior lecturer in public policy, Harvard University; **Thierry Gaudin,** cofounder and president, France 2100 Foundation; **Dan Gillmor,** director at the Knight Center for Digital Media Entrepreneurship at Arizona State University; **Herbert Gintis,** external professor, Santa Fe Institute; **Gina Glantz,** political strategist and founder of GenderAvenger; **Eric Goldman,** professor and director, High-Tech Law

Institute, Santa Clara University School of Law; **Neal Gorenflo,** cofounder, chief editor and executive director at Shareable; **Kenneth Grady**, futurist, founding author of The Algorithmic Society blog; **Erhardt Graeff,** researcher expert in the design and use of technology for civic and political engagement, Olin College of Engineering; **Jonathan Grudin**, principal researcher, Microsoft; **Bulbul Gupta,** founding adviser, Socos Labs, a think tank designing artificial intelligence to maximize human potential; **John Harlow,** smart-city research specialist, Engagement Lab, Emerson College; **Gry Hasselbalch,** cofounder, DataEthicsEU; **Bernie Hogan**, senior research fellow, Oxford Internet Institute; **Jason Hong,** professor, Human-Computer Interaction Institute, Carnegie-Mellon University; **Terri Horton,** workforce futurist, FuturePath LLC; **Christian Huitema,** president, Private Octopus; **Alan Inouye,** senior director for public policy and government, American Library Association; **Shel Israel,** Forbes columnist and author of many books on disruptive technologies; **Mark Jamison,** professor at the University of Florida and visiting scholar at American Enterprise Institute, previously manager of regulatory policy at Sprint; **Jeff Jarvis**, director, Tow-Knight Center, City University of New York; **Bryan Johnson**, founder and CEO, Kernel (developer of advanced neural interfaces) and at OS Fund; **Jeff Johnson,** professor of computer science, University of San Francisco, previously worked at Xerox, HP Labs and Sun Microsystems; **Kevin Doyle Jones,** cofounder, GatherLab; **Rey Junco,** director of research, CIRCLE, Tisch College of Civic Life, Tufts University; **Gabriel Kahn,** former bureau chief, The Wall Street Journal; **Michael Kleeman**, senior fellow, University of California, San Diego, and board member, Institute for the Future; **Gary L. Kreps**, distinguished professor and director of the Center for Health and Risk Communication, George Mason University; **Jon Lebkowsky,** CEO, founder and digital strategist, Polycot Associates; **Henry Lieberman,** research scientist, MIT Computer Science and Artificial Intelligence Lab; **Leah Lievrouw,** professor of information studies, University of California-Los Angeles; **Isaac Mao,** director, Sharism Lab; **Larry Masinter,** internet pioneer formerly with Adobe, ATT Labs, Xerox PARC; **Yves Mathieu,** co-director, Missions Publiques, Paris, France; **Mary Alice McCarthy,** senior policy analyst, Higher Education Initiative, New America; **Filippo Menczer,** grantee, Knight Foundation Democracy Project, and professor of informatics and computer science, Indiana University; **Jerry Michalski**, founder, Relationship Economy eXpedition (REX); **Melissa Michelson,** professor of political science, Menlo College; **Steven Miller**, vice provost and professor of information systems, Singapore Management University; **Christopher Mondini,** vice president of business engagement, ICANN; **Mario Morino,** chairman, Morino Institute, and cofounder, Venture Philanthropy Partners; **Alan Mutter,** consultant and former Silicon Valley CEO; **Andrew Nachison,** chief marketing officer, National Community Reinvestment Coalition; **Gina Neff,** senior research fellow, Oxford Internet Institute, studying innovation and digital transformation; **Joshua New,** senior policy analyst, Center for Data Innovation at the Information Technology and Innovation Foundation; **Mutale Nkonde,** adviser on artificial intelligence, Data & Society, and fellow, Harvard's Berkman-Klein Center for

Internet and Society; **David Noelle,** professor and researcher into computational cognitive neuroscience, University of California-Merced; **Beth Noveck,** director, New York University Governance Lab; **Zizi Papacharissi,** professor of communication and political science, University of Illinois-Chicago; **Tony Patt,** professor of climate policy, ETH Zurich, and author of "Transforming Energy: Solving Climate Change with Technology Policy"; **John Pike,** director and founder of GlobalSecurity.org; **Michael Pilos,** chief marketing officer, FirePro; **Alejandro Pisanty,** professor, the National University of Mexico, and activist in multistakeholder internet governance; **Paola Ricaurte,** fellow, Berkman Klein Center for Internet & Society; **Michael M. Roberts**, Internet Hall of Fame member and first president and CEO of ICANN; **Srinivasan Ramani,** Internet Hall of Fame member and pioneer of the internet in India; **David P. Reed,** pioneering architect of the internet expert in networking, spectrum and internet policy; **Marc Rotenberg**, director of a major digital civil rights organization; **Daniel Rogers,** cofounder of the Global Disinformation Initiative; **Eileen Ruddin,** cofounder and board chair, LearnLaunch Inc.; **Douglas Rushkoff**, writer, documentarian and professor of media, City University of New York; **Jean Russell,** co-director, Commons Engine; **Paul Saffo,** chair for futures studies and forecasting, Singularity University; **Rich Salz,** senior architect, Akamai Technologies; **Hans J. Scholl,** professor, The Information School, University of Washington; **Loren DeJonge Schulman,** deputy director of studies and senior fellow, Center for a New American Security; **Henning Schulzrinne**, Internet Hall of Fame member, co-chair of the Internet Technical Committee of the IEEE and professor at Columbia University; **Doc Searls,** internet pioneer and editor-in-chief of Linux Journal; **Artur Serra,** deputy director, i2CQT Foundation and Research Director of Citilab, Catalonia, Spain; **Gretchen Steenstra**, technology consultant for associations and nonprofit organizations; **Evan Selinger**, professor of philosophy, Rochester Institute of Technology; **Ben Shneiderman,** distinguished professor of computer science and founder of Human Computer Interaction Lab, University of Maryland; **Barbara Simons,** past president of the Association for Computing Machinery; **Peter W. Singer**, founding director of the Center for 21st Century Security and Intelligence, The Brookings Institution; **Deb Socia,** executive director, Next Century Cities; **Sharon Sputz,** executive director, strategic programs, Columbia University Data Science Institute; **Mark Surman,** executive director, Mozilla Foundation, and cofounder, Commons Group; **Jonathan Taplin,** author of "Move Fast and Break Things: How Google, Facebook and Amazon Cornered Culture and Undermined Democracy"; **Brad Templeton,** internet pioneer, futurist and activist, a former president of the Electronic Frontier Foundation; **Charis Thompson,** professor of sociology, London School of Economics, and member of the World Economic Forum's Global Technology Council on Technology, Values and Policy; **Lokman Tsui,** activist scholar, School of Journalism and Communication of The Chinese University of Hong Kong, formerly Google's Head of Free Expression in Asia and the Pacific; **Joseph Turow,** professor of communication, University of Pennsylvania; **Stuart A. Umpleby**, professor and director of the research program in social and

organizational learning at George Washington University; **Amy Webb**, founder, Future Today Institute, and professor of strategic foresight, New York University; **David Weinberger,** senior researcher, Harvard Berkman Klein Center for Internet & Society; **Russ White,** infrastructure architect and internet pioneer; **Lawrence Wilkinson,** chairman at Heminge & Condell and founding president of Global Business Network, the pioneering scenario-planning futures group; **Warren Yoder,** longtime director at Public Policy Center of Mississippi, now an executive coach; **Ethan Zuckerman,** director, MIT's Center for Civic Media, and cofounder, Global Voices; **Cliff Zukin**, professor of public policy and political science, School for Planning and Public Policy and the Eagleton Institute of Politics, Rutgers University.

A selection of institutions at which some of the respondents work or have affiliations:

Access Now; Akamai Technologies; Altimeter Group; American Institute for Behavioral Research and Technology; American Library Association; Anticipatory Futures Group; Appropedia Foundation; Arizona State University; Aspen Institute; AT&T; Australian National University; Bloomberg Businessweek; Brookings Institution; BT Group; Carnegie Mellon University; Center for a New American Security; Center for Data Innovation; Centre for Policy Modelling, Manchester Metropolitan University; Centre National de la Recherche Scientifique, France; Chinese University of Hong Kong; Cisco Systems; Cloudflare; Columbia University; Cornell University; Corporation for National Research Initiatives; Council of Europe; Agency for Electronic Government and Information Society in Uruguay; Electronic Frontier Foundation; Electronic Privacy Information Center; Foresight Alliance; Future Today Institute; Futuremade; Futurous; FuturePath; Futureproof Strategies; General Electric; Georgetown University, Georgia Tech; Global Business Network; Global Voices; Google; Harvard University; Hokkaido University, Japan; IBM; Internet Corporation for Assigned Names and Numbers (ICANN); Ignite Social Media; Information Technology and Innovation Foundation; Institute for the Future; Instituto Superior Técnico, Portugal; Institute for Ethics and Emerging Technologies; International Centre for Free and Open Source Software; Internet Engineering Task Force (IETF); Internet Society; Johns Hopkins University; Institute of Electrical and Electronics Engineers (IEEE); InterWorking Labs; Kernel; Leading Futurists; Macquarie University, Sydney, Australia; Massachusetts Institute of Technology; Menlo College, Microsoft Research; Millennium Project; Missions Publiques; Mozilla Foundation; Nanyang Technological University, Singapore; National Chengchi University, Taiwan; NetLab; The New School; New York University; Next Century Cities; Ontario College of Art and Design; Open the Future; Oxford Internet Institute; Packet Clearing House; People-Centered Internet; Perimeter Institute for Theoretical Physics; Politecnico di Milano; Princeton University; Privacy International; PROSOCIAL; RAD Data Communications; Rochester Institute of Technology; Rose-Hulman Institute of Technology; RTI International; SRI International; Sharism Lab; Singularity University; Singapore Management University; SLAC National Accelerator

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Complete sets of credited and anonymous responses can be found here:

https://www.elon.edu/u/imagining/surveys/future-of-democracy-2020/credit/

https://www.elon.edu/u/imagining/surveys/future-of-democracy-2020/anonymous/

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