FOR RELEASE OCTOBER 29, 2019

What Will Historians' Verdict be 50 Years from Now About the Impact of the Internet on People's Lives Today?

Experts expect that by 2069 today's period of human-tech evolution could come to be seen as a risks-ridden time that eventually led to a grand redefinition of civilization or it could be seen as a 'wasted opportunity' that simply 'updated and replicated legacy colonial hierarchies'

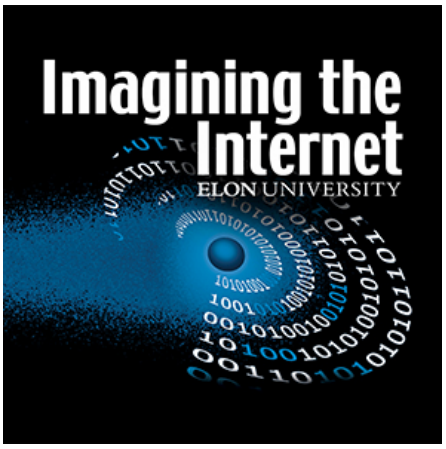
By Janna Anderson
Executive director, Elon University's Imagining the Internet Center

FOR MEDIA OR OTHER INQUIRIES:

Owen Covington, News Bureau Director,
Elon University

336.278.7413
www.elon.edu

RECOMMENDED CITATION
Elon University's Imagining the Internet Center, October 29, 2019, "2069 Historians' Verdict of Internet Impact 2019"



About the Imagining the Internet Center

Elon University's Imagining the Internet Center explores and provides insights into emerging network innovations, global development, dynamics, diffusion and governance. Its research holds a mirror to humanity's use of communications technologies, informs policy development, exposes potential futures and provides a historic record. It works to illuminate issues in order to serve the greater good, making its work public, free and open. The Imagining the Internet Center sponsors work that brings people together to share their visions for the future of communications and the future of the world.

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How might the current age of the internet be evaluated by historians 50 years from now?

Elon University's Imagining the Internet Center canvassed hundreds of researchers, technology innovators, business leaders, policy experts, Internet Hall of Fame members, journalists and members of civil society organizations asking, "What will historians' verdict be 50 years from now about the impact of the internet on people's social, economic and political lives today?" The 530 respondents' comments cut across a wide swath of positivity, worry, disenchantment, wonder, hope and disillusionment and reflected current societal attitudes about today's trends.

Cliff Zukin, professor of public policy and political science at Rutgers University, said, "A historian's view will be of the internet as a disrupter of order. Looking at the historical literature in the communication field of 'innovation diffusion' there will be no previous cases that look anything like the speed and depth of public penetration and use of the internet. The internet will be seen as having reallocated information and power in a way that we now cannot know. There will be new winners and new losers, as is always the case."

Chao-Lin Liu, a professor at National Chengchi University, Taiwan, said, "They will say the internet changed people's interactions and their being forever."

George Kubik, president of Anticipatory Futures Group, wrote, "It will be considered one of the greatest accelerators of human evolution."

Many participants in this study echoed the comment made by **.John Willinsky**, professor and director of the Public Knowledge Project at Stanford University. He predicted, "Historians will see it to be as profound and epoch-making as the introduction of the printing press in the West during the 15th century."

Patrick Lambe, a partner at Straits Knowledge, wrote, "They will report this was a period of immense social and political turmoil brought about by the capabilities that new technology gave

without sufficiently-mature institutional mechanisms in place to govern the effects. This is analogous to the political and social turmoil in following the introduction of the printing press."

Karine Perset, an economist in OECD's digital economy policy division, wrote, "Historians' verdict 50 years from now could be that in 2018 we were still in the Middles Ages in regard to the internet and interconnected AI systems, just beginning to shift the paradigm for the human race."

"We used that power to take photographs of our dinner…"

Broad points of view about future historians' likely verdict

Baratunde Thurston, futurist and co-founder of comedy/technology start-up Cultivated Wit, predicted that historians 50 years hence might say, "Although there was a period of great upending in which our social lives became more tenuous and fractured, the internet largely benefited us socially… While a few people were able to capture outsized economic upside from networked technologies most people lacked the power to negotiate better terms and were left to chase ever-changing algorithmic management directives and be compensated with discounts on Netflix… Increased volatility over economic disenfranchisement and social fragmentation made for a period of extremely combative politics that came close to civil war on a number of occasions. But, with more inclusive management of shared resources, politics today objectively benefits the greater number. Still, that stability has some feeling sidelined."

Jonathan Swerdloff, consultant and data systems specialist for Driven Inc., wrote, "In 50 years historians will be shocked that we had access to nearly all of the knowledge in history and used that power to take photographs of our dinner."

Anonymous respondents said historians 50 years from now might say the current age of the internet:

- "Redefined civilization."
- "Enabled the rise of another social order."
- "Could be the most significant era of human history."
- "Led to the spread and dominion of Western values, economic power and political control."
- "Drastically sped up technological progress and led to the emergence of global society."
- "Led to dramatic changes in how people view the world, thus dramatically changed the pillars on which society is built."
- "Has accelerated capital, communication and connection."
- "Has simply updated and replicated legacy colonial hierarchies."

- "Led to data and information becoming a major asset and a 'commodity.'"
- "Was the era in which humans had to create systems to cope with large-scale continuous disruptions."
- "Served us in many ways, but failed us in ways that even now we are unaware of."
- "Was not as important as climate change and other elements of its time."
- Was the point of creation of "a Jinn: a genie who grants the insidious and perverse inverse of any wish. In building a technology to bring the world together, we gave it the perfect tool to rip itself apart."
- "Economically it has been a boon. Politically it created polarity. Socially, the verdict is still up in the air. The next 10 years will be important."

Rob Frieden, professor and Pioneers Chair in Telecommunications and Law at Penn State University, wrote, "They will say that cyber-optimists oversold and the internet under-delivered. Historians will track irrational exuberance followed by a balancing of good and evil."

Bert Huang, an assistant professor in the Department of Computer Science at Virginia, wrote, "In 50 years, pre-internet social, economic and political lives will be unrecognizable to people."

Ryan Sweeney, director of analytics at Ignite Social Media, commented, "The internet will have had such a profound impact that historians will have to segment human history into *Before Internet* and *After Internet*."

Jennifer Jarratt, owner of Leading Futurists consultancy, commented that historians might ask how people of the current generation "have been so slow in realizing what we had and so slow in using it to improve our world?"

Bernie Hogan, senior research fellow at Oxford Internet Institute, commented, "Historians will smirk at how naive we were to think we could arrange technologies and that they would just 'work' or only have positive effects."

Liz Rykert, president at Meta Strategies, a consultancy that works with technology and complex organizational change, said historians in 2069 will note that, "The ability to be connected and the difference this has made for human safety and development creates positives, despite the potential downsides."

Sam Ladner, a former UX researcher for Amazon and Microsoft now an adjunct professor at Ontario College of Art & Design, wrote, "The internet's impact will be written as a tale of unexpected consequences."

Jeff Johnson, computer science professor at the University of San Francisco, previously with Xerox, HP Labs and Sun Microsystems, predicted, "They may say that the internet as we now know it eventually had to be replaced with a system that is less free-wheeling and more secure that prevents distribution of false information and is less driven by advertising and more by subscription fees."

Sherry Turkle, MIT professor of sociology, expert on humans and technology and author of "Alone Together," said, "We are at a point of inflection. Now is the time to determine what those historians will think of us in every aspect of our civic and informational life. They go together."

Andreas Kirsch, fellow at Newspeak House, formerly with Google and DeepMind in Zurich and London, wrote, "The internet will be seen as a big catalyst for change, and it will be seen as the main reason for whatever the prevalent 'world order' will be."

Nicholas Beale, leader of the strategy practice at Sciteb, an international strategy and search firm, said historians will report, "Amongst the great fruits of the internet some foul weeds were allowed to flourish that, choose one: wrecked Western society *or* were eventually pruned effectively for the common good." He added, "Which of these two alternatives will [occur] will be determined by events, but should be clear in 50 years' time."

Several respondents agreed with the view of **Michel Grossetti**, director of research at CNRS, the French national science center. He said "the period 1969-2018 was more impacted by global warming and economic deregulation than by technological changes." And **Thomas Streeter**, a professor of sociology at the University of Vermont, said, "If historians are still doing their job well in 50 years, they will wonder why we talked so much about the internet in the 1992-2016 period when so much else was going on that we noticed only too late."

Bryan Johnson, founder and CEO of Kernel, a leading developer of advanced neural interfaces, and OS Fund, a venture capital firm, said, "They will say the internet demonstrated that the world was too complex and contained too much data for humans and especially any one human to make sense of. History will look back on this as a defining moment in human well-being, when we realized that we must incentivize radical human improvement or go extinct. We've hit our ceiling at what our default cognitive configuration can achieve, and the internet helped us realize that."

Jamais Cascio, research fellow at the Institute for the Future, predicted, "A growing number of historians/analysts of 2069 will declare that the internet was a mistake (much as many present-day observers now say suburbs and automobiles were a mistake to adopt). In 50 years, the nostalgia for the mythical early internet before bots and trolls really got bad in the 2020s will be commonplace, as at that point people who lived at that time will be dying off."

Themes among respondents' remarks

The rest of this report is organized in sections according to several overarching themes found in an analysis of all of the responses to the research question. In brief, they include the following:

- The internet ushered in a risks-ridden time resulting in overwhelming social concerns
- The internet helped humanity reduce risk, improved countless lives
- 2019 was a difficult turning point at which people overcame big challenges
- 2019 was a dangerous turning point of human failure
- The internet led to overwhelming advances for global good despite its down sides
- It initiated somewhat dystopian social decline along with its high-value social benefits
- It enabled overall change for the better, change for the worse
- The internet could eventually lead to technology's overthrow of humanity
- The development of the internet will not seem very significant to historians of 2069
- Historians might not be well-informed about the early 2000s due to 'digital decay'
- Will there be any historians 50 years from now?

Following are more predictive comments about what historians in 2069 might say about the internet of today.

It was a risks-ridden time, resulting in overwhelming social concerns

Jerry Michalski, founder of the Relationship Economy eXpedition, predicted, "Historians will marvel at how we let potential utopias slip from our grasp, descending instead into willful blindness, global battles over limiting world views, petty superstitions and very real fears for personal safety."

Douglas Rushkoff, a professor of media at City University of New York, said, "If historians are still around, I think they'll see mostly a missed potential."

Warren Yoder, longtime director of the Public Policy Center of Mississippi, responded, "That it took well into the second half of the net's first century for people to change the polity to handle net-induced changes to the culture and the economy."

José Estabil, director of entrepreneurship and innovation at MIT's Skoltech Initiative, commented, "They will note how fundamentally we underestimated what was possible to achieve."

Craig Partridge, chief scientist at Raytheon BBN Technologies for 35 years and Internet Hall of Famer, currently chair of the department of computer science at Colorado State University, wrote, "I suspect they'll see us as being in the later stages of a digital Wild West. We'll be seen as being in a time where the opportunities were so obvious and plentiful and likely positive that society and governments were somewhat reluctant to interfere – with the result that great things happened but also some bad things. And they'll talk about how we built these grand innovations (voice-controlled houses, self-driving vehicles) without fully securing the underlying infrastructure."

Luis Pereira, associate professor of electronics and nanotechnologies, Universidade Nova de Lisboa, Portugal, said, "It was a qualitatively unprecedented degree of social revolution started with unpredictable risky outcomes."

Anthony Judge, author, futurist, editor of the Encyclopedia of World Problems and Human Potential, former head of the Union of International Associations, said, "[They will see it as] an amazing opportunity inappropriately exploited in a period of crisis, requiring a much-higher-order response to knowledge management across a diversity of mutually contradictory views."

Dan Schultz, senior creative technologist at Internet Archive, responded, "We were woefully untrained and unprepared for the mind-searing power of instant communication between every thought and memory of the world."

David Cake, vice-chair of the ICANN GNSO Council, wrote, "They will understand the current era as a period of turmoil and confusion in which many things happened that seem like obvious risks in hindsight."

Hume Winzar, associate professor and director of the business analytics undergraduate program at Macquarie University, Sydney, Australia, wrote, "It was a wonderful opportunity screwed up."

Several respondents focused on the struggles emerging as humanity adjusted to accelerating technological change at the start of the new millennium – to a new age in which, for the first time, most of the world had access to instant, global interconnectivity.

Anirban Sen, a lawyer and data privacy consultant, based in New Delhi, India, wrote, "Historians will see the geometric rise in human evolution; however, for all the advancement they will wonder why the human consciousness did not rise. And they will realise that the human brain is primitive and limited and, despite all the wonders of tech, it still processes everything the same way it did eons ago. Consequently, humans could not take advantage of all that technology had to offer but continued to stumble at the gateway of collective growth."

Andrew Wyckoff, director of the OECD Directorate for Science, Technology and Innovation, wrote, "Historians will be bemused by the fact that few of the major nation-states were able to successfully foresee the need to proactively shift their policy frameworks, cast in the image of industry (especially motor vehicles), to the new economic and social paradigm driven by ubiquitous computing and data, and instead reacted defensively to the transformation, inflicting more pain and angst on citizens than needed."

Pamela Rutledge, director of the Media Psychology Center, responded, "The most extraordinary thing [of note about current times] is the rapidity of change and humans' cognitive limitations to adapt with equal speed."

Manoj Kumar, manager at Mitsui Orient Lines, responded, "Overwhelmingly. the span of last 50 years has changed the world for better, creating question marks for the next 50 years. The achievements may leave the historians bewildered at the pace, which itself can provide the clue for its regress."

John Verdon, retired futurist and consultant, wrote, "When the digital environment shifted the world to a new attractor of governance and efficiency that favored self-organization, the depth and force of incumbents' in-fighting to preserve the problems to which it was the solution was stunning."

A share of respondents said they expect historians in 2069 to note the ways in which commercial businesses' focus on profit and governments' passivity led the digital communications revolution down a path that was not optimal for most individuals.

Bill Woodcock, executive director at Packet Clearing House, the research organization behind global network development, commented, "The intellectual utility of the internet, which was clear to its users in the 1970s and 1980s, gave way to get-rich-quick schemes in the dot-com boom and the era of spam, and it has continued downhill since the arrival of Facebook, spearfishing, man-in-the-middle attacks and mass surveillance. In retrospect the internet will be seen in much the same way as television and the advertising industry are today: technologies that held initial promise and sparked people's imaginations as to how they could improve society and the human condition, but which eventually just became tools of avarice."

Michael Kleeman, a senior fellow at the University of California – San Diego and board member at the Institute for the Future, wrote, "What started with great promise was compromised by profit versus social incentives, and, in the end, was a mixture of information distribution and social control. We can access more, we know each other less and we are more controlled and have no privacy."

Sam Punnett, research and strategy officer at TableRock Media, wrote, "Historians' commentary will likely center upon our leaders and their reaction to chaos created by changes enabled by the internet, and upon the flow of data and decision-making made in reaction to the disruption of 20th century systems."

Robert M. Mason, a professor emeritus in the Information School at the University of Washington, responded, "They will say the leaders and institutions in the developed nations in the late 19th century and early 20th century failed to recognize the internet's remarkable opportunities and their global responsibilities to realize these opportunities."

Ramon Lopez de Mantaras, director of the Spanish National Research Council's Artificial Intelligence Research Institute, said, "There will obviously be very positive things to say, but we might regret having invented the internet."

Vian Bakir, a professor of political communication and journalism at Bangor University, responded, "They will ask, 'Why did we let this genie out of the box without iron chains to keep it? Why did we allow society to give up personal control over what can be easily known about them via their data trails?'"

Valarie Bell, a computational social scientist at the University of North Texas, said historians will report, "No matter what people create, someone will find ways to deviate it, misuse it, harmfully exploit it. That's just people."

Geoff Arnold, CTO for the Verizon Smart Communities organization, said, "They will note the naïveté of governing institutions in the face of manipulation."

An executive director said, "In the future our uncritical embrace of unregulated resources will be considered naïve and foolish. In particular, studies of the use and abuse of social media will probably keep social scientists busy for decades."

Jack Gieseking, a University of Kentucky professor expert in cultural geography, American studies and gender and sexuality, said, "They will say that establishing supportive policy for all – over data and the people it belongs to as well as algorithms and the people they define – rather than allowing capitalist accumulation for a few would have made for a much better world."

An assistant professor of media studies a major U.S. university commented, "In 50 years, historians will discuss the failure of platform providers such as Facebook and Google to act responsibly as stewards of public culture. The argument that platforms are 'neutral' or 'mere technology' will seem naive and disingenuous."

Additional **anonymous respondents** said historians 50 years from now might say:

- "How naive they were.'"
- "Individual freedom was lost in transition in exchange for perceived personal abundance."
- "That we responded too slowly to regulate technology before it was further implemented into society."
- "We were immature and primitive."
- "We used it without first assessing whether it is the best tool or not."
- "It became too controlling of people's lives."
- "We learned more about our nature, and about information's ability to do great good or great harm."
- "The lack of mechanisms to enforce social mores on the internet allowed bad actors to inflict severe social, economic and political pains across the spectrum."
- "We should have had an international framework for regulating the internet to stop it from being used by unscrupulous people."
- "This digital-culture experiment will not be viewed well. Generally, they will have a negative verdict. It is high time we wake up."
- "There was a lack of the political vision and will to ensure legal protections for consumer/user/constituents' rights and privacy, combined with a lack of vision in how to build media literacy into education curricula."
- "How future historians see the internet of this period depends on how effectively we change it in the next few years to make the subversion of democracy more difficult."

Paul Vixie, an Internet Hall of Fame member known for designing and implementing several Domain Name System protocol extensions and applications, wrote, "They will say the information revolution ushered in the era of popular delusions and the madness of crowds."

Oscar Gandy, emeritus professor of communication at the University of Pennsylvania, responded, "I can't know what historians' verdict will be, although I suspect that my critical assessment is or will be shared by a great many: That we have been led astray."

The network of networks helped humanity reduce risk, improved countless lives

Respondents optimistically predicted historians of 2069 will report that people of today worked together to advance humanity in countless ways implementing digital networks, reducing the level of risk and increasing the level of well-being globally in many categories.

Steve Crocker, CEO and co-founder of Shinkuro, Inc., internet pioneer and Internet Hall of Fame member, responded, "Jared Diamond has written about the long history of risk reduction. I think historians will look back on this period, see a continued reduction in risk and attribute much of the improvement to the internet and AI."

Jerome Glenn, executive director of the State of the Future reports for the Millennium Project, said, "Historians will say the internet laid the foundation for the evolution of the global Conscious-Technology Civilization and the Self-Actualization Economy."

Ken Goldberg, distinguished chair in engineering, director of AUTOLAB and CITRIS "People and Robots" Initiative, University of California – Berkeley, wrote, "It spurred a huge leap forward in humanity's ability to learn and collaborate."

Walid Al-Saqaf, senior lecturer at Sodertorn University, member of the board of trustees of the Internet Society, said, "They will say it had major positive impact driven by sharing knowledge."

Amali De Silva-Mitchell, futurist, responded, "[They will report the world] could not have coped with the enormous increase in population and stress on services and product consumption without the internet."

David Bray, executive director for the People-Centered Internet Coalition, commented, "What we are seeing [globally] is an increasing affordability and availability of technologies that only were available to large nation-states 20 years ago."

An anonymous respondent commented, "Historians will agree the internet has reshaped social, political and economic life, enabling major trends such as remote work, globalized supply chains, online shopping, cloud information services and so on."

An anonymous respondent commented, "It brought about the global leavening of human culture without any one culture losing its uniqueness."

An anonymous respondent commented, "Historians will note a wealth of global knowledge resulting from the internet."

A member of the editorial board of an ACM journal said, "They will point out the digital transformation undergone by organisations and the promise of civic technologies and government technologies to serve citizens."

Andrew Tutt, an expert in law and author of "An FDA for Algorithms," said, "The mainstream consensus view among historians will be that the internet vastly improved peoples' social, economic and political lives. A vocal minority of historians will likely contest each of those claims on the grounds that the internet's benefits have been unevenly distributed and occasionally detrimental. Some will emphasize the way in which the internet led to social isolation and violent extremism. Some will decry the way in which the internet concentrated wealth and power in the hands of a small number of powerful companies. Some will say that the internet had a destabilizing effect on politics and contributed to the dissolution of political norms. But, in the aggregate, it cannot be denied that the good has far outweighed the bad along all of these dimensions."

2019 was a difficult turning point at which people overcame big challenges

A number of respondents expect that historians of 2069 will be able to report that humanity adjusted in good time, evolving with the new communications tools and prevailing positively.

Mark Surman, executive director of the Mozilla Foundation, responded, "I hope historians will say 'Wow, those humans saw how the internet and AI took a wrong turn, and they were smart enough to roll up their sleeves and put it back on the right path.'"

An information-science futurist commented, "In 50 years, historians might say, 'It's been a rocky ride, but we've come a long way since our struggle through the early part of the century. The internet is a powerful force. We must continue to learn from our mistakes and take the long view, so we don't repeat the past.'"

Kyle Rose, principal architect, Akamai Technologies, responded, "The verdict will be that change was overwhelmingly positive but not monotonic. The internet has enabled both positive and negative social changes, but as an eternal optimist with respect to human progress, I believe the negative changes will be merely temporary as society figures out how to adapt."

A principal architect for a top-five technology company and longtime contributor to the IETF predicted, "After a massive crackdown on the Bonnies and Clydes of Cyberspace, history will mark the end of the 'Wild West' internet phase."

Justin Amyx, a technician with Comcast, said, "Historians will look on our times as a time of adaptation – our ability as humans to adapt to our changing environment – with the evolution of technology outpacing our ability to adapt to a digital landscape. Learning to co-exist with this

rapid change, from analog to digital, has been a very bumpy road that is far too often overlooked."

Paul Jones, professor of information science at the University of North Carolina – Chapel Hill, responded, "We will have struggle in the immediate future. As with sailing, printing, industrialization, mass transportation and other advances, the intelligence revolution is being co-opted as a way to achieve power and dominance. But also, over time, our lives will continue to be enriched and provide even to those at the margins improved situations and that one essential: hope."

Raimundo Beca, partner at Imaginacción, formerly a member of the ICANN board, said, "Historians will say that finally the divide between the haves and have-nots has disappeared."

Many noted that the primary challenges and fears for today and the future arise from humans' tribal instincts. **Richard Forno**, of the Center for Cybersecurity and Cybersecurity Graduate Program at the University of Maryland – Baltimore County, wrote, "Future historians will likely note that the internet simply reflects the human condition, complete with all of its good and bad qualities. Looking back, they'll probably also wonder how we as a society survived so that they are able to be around to ask that question!"

Karen Oates, director of workforce development and financial stability for La Casea de Esperanza, commented, "If, as a society and a people, we are unable to respect the dignity of each person, extend compassion to others and love our neighbors as ourselves, historians will see the U.S. as another fallen empire like the many that have gone before. We will have misused technology to the detriment of many, especially the lower classes."

Ebenezer Baldwin Bowles, author, editor and journalist, responded, "History might see us as participants in a golden age of cyber innocence where concepts of unfettered personal expression were viewed with respect and promise. As always, innocence falls prey to experience, and sometimes to betrayal and bitterness, so that those of us who believed in an expansive and open World Wide Web, rooted in respect and mutual interest, were ultimately proved delusional."

Brad Templeton, chair for computing at Singularity University, software architect and former president of the Electronic Frontier Foundation, responded, "My hope is that they will view these as the dark times, the times before we found solutions to the propaganda problem."

A professor of applied computational linguistics based in Europe wrote, "Hopefully, it will be retrospectively seen that there was a crisis – as bad actors used the internet to undermine consensus – but it was overcome."

Wendy Hall, professor of computer science at the University of Southampton, U.K., and executive director of the Web Science Institute, said, "They will note how much self-harm society is doing with the internet. Hopefully in 50 years' time we will have developed an antidote."

R "Ray" Wang, founder and principal analyst at Silicon Valley-based Constellation Research, said, "The verdict will show that the first 50 years was about exploration and freedom; the second 50 showed a struggle to fight the forces of evil and keep the internet as an open means of communication, sharing and collaboration. And in the end the goodness of humanity won out, leading to sweeping laws assuring rights, for instance, digital privacy became a property right where individuals have control over the data spun off of their interactions and could monetize it at will or choose not to monetize."

Benjamin Kuipers, a professor of computer science at the University of Michigan, wrote, "In the positive future scenario I choose to endorse, historians will say that now is the time when humanity explicitly learned about the critical roles that trust and cooperation play in the viability of societies. Humanity began to learn how to recognize and defend itself against individuals willing to exploit fear and distrust to accumulate power. Just as the Great Depression led to advances in economics making it possible to manage the economy with some degree of success, our current crisis will lead to a science of social trust and cooperation that will help society survive and thrive."

2019 was a dangerous turning point of human failure

A number of respondents were not so sure that it will be clear by 2069 that there will be a great deal of positive progress any time soon toward overcoming the problems they see emerging today.

Peter Reiner, professor and co-founder of the National Core for Neuroethics at the University of British Columbia, Canada, commented, "The internet is likely to morph into a monster that is much different and likely more unwieldy than the internet we know today."

Grace Mutung'u, co-leader of the Kenya ICT Action Network, responded, "Historians might probably begin by describing the internet with Frankenstein's story. It grew bigger than its creators."

A general manager for a U.S. university wrote, “Historians will wonder why we allowed such destructive forces to be unleashed unchecked and why so many people did nothing about it.”

Lee McKnight, associate professor, School of Information Studies, Syracuse University, commented, “Historians will condemn us for our neglect of ensuring cyber-physical security and trust even as our daily lives, firms and national economies grew ever more dependent on the internet… Open societies and open systems are always under attack from those that prefer the opposite. Why we ever thought it a good idea to cede to digital platforms all of our inherent human data will be a mystery and the subject of many dissertations, archaeological digs and forensic investigations.”

Simon Biggs, a professor of interdisciplinary arts at the University of Edinburgh, said, “Historians might one day observe how we delivered ourselves as consumers to be consumed – similarly to how historians today observe the hypnotic control fascists had over their populations in the mid-20th century.”

Andrian Kreye, a journalist and documentary filmmaker based in Germany, said, “Historians will look at the current impact of the internet either as the first mistakes mankind learned from or as the beginning of a development destroying many advances society made in the 20th century.”

Mike O’Connor, a retired technologist who worked at ICANN and on U.S. national broadband issues, commented, “It was a major contributor to the current environmental and authoritarian disaster that surrounds us.”

Lou Gross, professor of mathematical ecology and expert in grid computing at the University of Tennessee – Knoxville, said, “That it led to the advancement of some groups and regions over others and led to enhancing many of the conflicts around the world rather than to alleviating them.”

Andrew Whinston, computer science professor and director of the Center for Research in Electronic Commerce, University of Texas – Austin, said, “The historians’ verdict will be written as ‘positive’ since we will live in controlled societies.”

Michiel Leenaars, director of strategy at NLnet Foundation, responded, “[Their point of view] depends on who will be paying those historians, and where they live. Of course, if we are unable to stop corporate exploitation and mass surveillance between now and then, the perspective will be different, too. Seen from a distant galaxy, the first 50 years of the internet are naive and morally tainted by the fundamental dishonesty of major actors. The U.S. government and the

NSA in particular may have had a spectacular espionage success through the internet, but this also means that this period of the internet goes down into the books as the largest and most successful Trojan horse in human history."

An online-communities researcher said, "They will say that it seemed to have promise, but eventually those speaking of that promise were the capitalists and they didn't care what happened as long as they made money so everything else fell apart."

Serge Marelli, an IT security analyst, responded, "They will say there was more porn, more advertising, less privacy, fewer users-citizens' rights (e.g., right to privacy), more money for big corporations, and politics and democracy fell short."

A digital-strategies consultant commented, "Historians will find our era indistinguishable from Jim Crow policies of the pre-Civil Rights era, with the return of global fascism, a new global 'Stasi' and 'KGB' lowering a Velvet Curtain into the deep infrastructure of our once-open internet. Service providers will throttle and censor content; algorithms will hide communications from possible recipients. Instead of mass marches, you will see Dark Web guerrilla groups and secret police disappearing people and laying waste to entire face-to-face communities."

Charles Ess, a professor expert in ethics with the Department of Media and Communication, University of Oslo, Norway, said, "It will count as a major component and driver of the emerging anthropocene – an era in which human mastery and possession of nature threatens to radically transform and, to some degree, annihilate what has been relatively normal for human societies and the large environment for some 10,000 years or so (longer if you look back to earlier societies and evolution). I'm hoping the good will outweigh the bad – but I find it difficult to discern clear and strong reasons to support anything more than a very modest hope that more good than not will follow."

Peter Levine, associate dean for research and professor of public affairs at Tufts University, wrote, "[Future historians' opinions] depend upon whether we are near the beginning of the loss of jobs and the decay of democracies or whether the next decade brings prosperity and better governance."

The internet led to overwhelming advances for global good despite its down sides

A large share of respondents expect historians of 2069 to see today's age as one that launched a mostly successful widespread era of global prosperity.

Greg Shannon, chief scientist for the CERT Division at Carnegie Mellon University's Software Engineering Institute, said, "Historians will say it was a Golden Age! Enlightenment 2.0."

Daniel Riera, a professor of computer science at Universitat Oberta de Catalunya, commented, "They will say it connected people and enhanced collaboration, it created business opportunities and it changed social realities."

Jay Sanders, president and CEO of the Global Telemedicine Group, responded, "The internet afforded an exponential growth in basic knowledge and expertise."

Charles Zheng, a researcher into machine learning and AI with the U.S. National Institute of Mental Health, commented, "Historians in 50 years will have a better sense of nuances of the effect of the internet and will understand a complex picture of the many positive and negative effects rather than a simple verdict of 'good' or 'bad.' However, one particular aspect they will be in a far better shape to appreciate will be the importance of the internet for nurturing the influential ideologies and social movements that play a major role in the coming half-century. I also expect that many of the important historical figures of the next 50 years may come from unconventional social backgrounds but will credit their education largely to the internet rather than a traditional schooling system."

Bryan Alexander, futurist and president of Bryan Anderson Consulting, responded, "Historians will see humanity of 2018 as living through a renaissance in human creativity and communication. As it was during the Italian Renaissance, this also meant political and social problems, at times involving the internet."

A top research director and technical fellow at a major global technology company said, "They will say the internet led to a deep and wide transformation of human society. It will be noted as a major, largely positive, disruption."

An anonymous respondent who works at a major global privacy initiative said, "They will say its profound impact touches everything. Who really thought about connected cars and smart refrigerators? And there's more to come we haven't thought about."

Jan Schaffer, founder and executive director of J-Lab – The Institute for Interactive Journalism, responded, "The internet will be credited with great technological and medical advances. It will be blamed for a decline in the quality of life and, writ large, a decline in longstanding democratic processes and expectations."

It initiated somewhat dystopian social decline along with social benefits

Barry Chudakov, founder and principal of Sertain Research and author of "Metalifestream," commented, "Historians will say the internet altered and often shattered borders, barriers and horizons, starting with the 'presentation of self in everyday life' where 'the cyber effect' turned each person to a branded identity. As a universal agora, socially it extended and enhanced relationships by obliterating distance – yet this also challenged relationships in equally powerful and unsettling ways. Economically it opened numerous opportunities but global participation – and global competition – made these opportunities precarious and often fleeting rather than permanent. Politically the new-identity morph of the internet made messaging both easy and suspect as bad actors impersonated and used disinformation and distortion (lies) to undermine information and gin up fear and tribal loyalties."

Lindsey Andersen, an activist at the intersection of human rights and technology for Freedom House and Internews now doing graduate research at Princeton University, said, "Historians will see how it simultaneously brought the world together while encouraging tribalism and fear of the 'other.' Whether they see it overall as a positive development, it will without a doubt have fundamentally altered the world."

John Sniadowski, a director for a technology company, wrote, "They will say that the internet became a massive, uncontrolled social experiment driven by corporate greed and governmental attempts to use it to gain intelligence on general populations."

A chief information security officer said, "They will realize that the ideas of '1984' and 'The Lord of the Flies' were realized by the Net."

Sy Taffel, lecturer in media studies at Massey University, New Zealand, wrote, "They will say the provision of free culture came at the cost of the commodification of community and mass surveillance."

Bruce Edmonds, a professor of social simulation and director of the Centre for Policy Modelling, Manchester (U.K.) Metropolitan University, wrote, "That it has been profound – shifting the ground on which production and interaction happens – but also that a new social space inevitably opens up new conflict and even wars for groups seeking to control that space, and hence also a destabilizing impact."

Ken Birman, a professor in the department of computer science at Cornell University, responded, "Historians will be awed by the inventiveness of technology innovators in this era, and by our social resilience in the face of such extreme disruptive change. But they will also be

horrified that we were so complacent about the erosion of privacy and security, and that we left ourselves so open to manipulation by various forces out to reshape the world in so many ways, be those political, religious or even social."

Anita Salem, systems research and design principal at SalemSystems, wrote, "The internet did not live up to its promise and became instead a mechanism for manipulation by the moneyed. While the internet opened the doors for modern communication and allowed people of all ages, backgrounds and economics ready access to information and tools that could better their lives, it also provided a backdoor for corporations to manipulate the population for their own benefit. The democracies and people of the world were not mature or empowered enough to prevent its misuse. The fundamental tenets of capitalism and the growth of unregulated corporate and authoritarian power proved to be its downfall."

Evan Selinger, a professor of philosophy at the Rochester Institute of Technology, commented, "Critical historians will marvel at how the dialectic of adaptation and manufactured preferences ramped up over time."

Jonathan Grudin, principal design researcher at Microsoft, commented, "Historians will say that by overwhelming us with ceaseless information about the present the internet ended our ability to take time to think about and learn from history."

A share of respondents said historians of 2069 will see today's shaping of digital life as a primary cause of the expansion of global inequality.

A program director at Harvard University said, "They will see that the 0.01% came to hoard all the wealth for themselves."

Sasha Costanza-Chock, associate professor of civic media at MIT, said, "Accurate histories will pay attention to the ways that the internet had both positive and negative impacts on people's lives, and on how a relatively small section of the planet's population reaped most of the benefits while the majority received most of the harms."

Marina Gorbis, executive director of the Institute for the Future and author of "The Nature of the Future," responded, "They will view the impact of the internet on economic, social and political lives in exactly the same way historians today are viewing the impact of the robber barons (railroad, oil, banking magnates) of the early 20th century. Development of the platform that has become an everyday utility was preceded by privatization of the commons, creating a powerful new class of digital robber barons but also leading to extreme wealth inequalities and social unrest (similar to what we saw with the development of physical infrastructure). Just like in the 20th century, the situation was not sustainable, and we had to break up some of the

digital monopolies, regulate some as utilities and develop new social policies that would correct for some of the economic inequalities."

Kenneth Grady, futurist and founding author of The Algorithmic Society blog, wrote, "Fifty years from now, historians will note that the rise of the internet accelerated inequality in the world occurring at this time. Economic, financial, social and political inequality (to name a few) all jumped because of what the internet provided. It will take many decades to reduce that inequality, and the lead some have gained over the others may make that impossible."

A journalist, author, blogger and leading internet activist wrote, "They will remember it as inequality's handmaiden, and as the apparatus that was used to organize against, and defeat, plutocratic corruption."

Kenneth Cukier, author and data editor for The Economist, commented, "It enabled fringe views to coalesce and influence the mainstream politics, media, commerce and discourse. It neutered the idea of the mainstream. Everyone was shunted into a subgroup. It balkanized the public sphere."

A director of a center for digital humanities located in the U.K. said, "It impacted everything in its detail and content but not its structure and form. Inequality is still a constant, as are political propaganda, global capitalism, etc. It amplified, exposed and complicated these things."

A fellow at Harvard expert in digital economic policy commented, "It was the beginning of an autocratic global regime."

A share of respondents said historians of 2069 will note that when traditional face-to-face human interaction was sacrificed for the digital in the current age it caused misunderstandings, fear, doubt and loss of trust to become more prevalent.

An anonymous respondent wrote, "Real-life interactions were greatly reduced." Another **anonymous respondent** wrote, "They'll say the internet added a lot, but it took away a sense of community, and society was forever changed. We can't relate as well to each other, the common man or the common good any longer."

The director of a center for technology and society located in the Silicon Valley area responded, "We will look back on the 2018 internet as having a growing negative political and social impact from disinformation, hate and harassment."

A professor of mathematics and statistics commented, "They will say that people in 2018 were really easily influenced by the internet – some were almost completely dependent on it for their social lives – and they were not very discerning about its content or use."

A professor of psychology for a human-computer interaction institute commented, "It initiated the decline of a social fabric."

An anonymous respondent commented, "Historians will note an increased obsession with self, the loss of privacy and a bipedal global economy.

An engineer and chief operating officer said, "It will not be a topic of historical debate unless you are happy to lose your job and have your identity disrupted."

A professor emeritus expert on technology's impacts on well-being wrote, "Historians will credit the internet with opening up the world's library and providing countless amounts of information with the tap of a finger. What is this doing to our attention spans and what is the shortening of our attention doing to our performance both productivity-wise and with our relationships? I hope we turn it around and it becomes a positive."

Aneesh Aneesh, author of "Global Labor: Algocratic Modes of Organization" and professor at the University of Wisconsin – Milwaukee, had a more-positive take on the social future, writing, "The Internet of Things, governed by what I call algocracy, will have the biggest impact on how we live. Social anomie, economic inequality and democratic deficit are likely to increase but there will be plenty of joy and enchantment resulting from technological breakthroughs."

Jennifer J. Snow, an innovation officer with U.S. Air Force USSOCOM Donovan Group and SOFWERX, suggested the social of the internet will seen as an effective social tool for individual advancement, "Historians will be surprised. We will see those nations and peoples we tend to ignore rise to the top because they will use these technologies to the best of their ability to better themselves and their countries while richer nations will become mired in fake information, lack of trust and lack of public support, leading to the rise of virtual nations that will offer people the opportunity to join a voluntary nation regardless of where they live that best meets their needs, beliefs, morals and norms."

It enabled change for the better, change for the worse

Fernando Barrio, director of the law program at the Universidad Nacional de Rio Negro, Argentina, commented, "In 50 years' time there will be those who focus on positives for the lives

of individuals with access to the benefits provided by the internet and its expansion, and there will be those who emphasize the perils for the people left behind – the lost privacy, the negative side of the alliance between governments and huge corporations and the widening gap between the haves and the have-nots."

Marek Havrda, director at NEOPAS and strategic adviser for the GoodAI project, said, "It will be a mixed verdict including positives such as increased productivity and connectedness among individual people, but also negatives including contribution to societal division and partial erosion of democracy in democratic countries and potentially 'Big Brother' scenarios in non-democratic countries. The verdict will depend on whose writing it."

Henning Schulzrinne, co-chair of the Internet Technical Committee of the IEEE Communications Society, professor at Columbia University, and Internet Hall of Fame member, said, "In some cases, the internet has acted as the better replacement for existing modes of communications, in others it has accelerated societal trends that were already visible, such as wealth inequality and societal fragmentation."

Thomas H. Davenport, distinguished professor at Babson College and fellow of the MIT Initiative on the Digital Economy, responded, "It will be a mixed verdict. In highly democratic societies, it will increase social and political participation and create a flowering of knowledge. In totalitarian societies it will be used to monitor and control citizens and stifle dissent."

Leonardo Trujillo, a research professor in computing sciences at the Instituto Tecnológico de Tijuana, Mexico, responded, "They will say the internet is an important technology for human development that brought about the potential to greatly simplify how information is generated, shared and communicated but it also led to the development of powerful surveillance and propaganda tools that had a negative impact in the way democracies function."

Peng Hwa Ang, professor of communications at Nanyang Technological University, commented, "One fundamental truth is that anything that is powerful for good can also be powerful for evil."

Michael H. Goldhaber, an author who wrote early explorations on the digital attention economy, said, "The key verdicts will be that mentalities changed, that geographic ties weakened, that centers of power became in some ways more remote from ordinary people, and yet, in some ways closer (e.g., presidential tweets)."

Michael Wollowski, associate professor of computer science and software engineering at Rose-Hulman Institute of Technology, wrote, "It led to more gossip, less critical thinking, easy access to goods and services and easy swaying of the masses."

Peter Asaro, a professor at The New School, philosopher of sci-tech and media who examines artificial intelligence and robotics, commented, "If the internet leads to unprecedented tyrannies or another world war, as industrial technologies and imperial aspirations did in the early 20th century, then it will probably be viewed negatively. If we manage to avoid that, it will probably be viewed positively."

James Hendler, director of the Rensselaer Polytechnic Institute for Data Exploration and Application, wrote, "Historians will say that the interaction of people around the world was changed in myriad ways, both for the better and for the worse."

A professional technologist commented, "I hope history is re-written along the way. Otherwise historians will look back at the early days of the internet and see its revolutionary potential – a limitless place where we could spend our time together, learn anything or be anyone… first animated by the soaring idealism of the scientists and early technologists who occupied its channels. But then attention and investment turned it into a small number of highly-controlled-yet-reliable meeting venues where people were encouraged to be reliable personas."

Additional **anonymous respondents** said the verdict of historians 50 years from now might be:

- "The result was both greater good and greater harm."
- "Some will praise it; some will revile it for all the reasons we are debating today."
- "It was a net positive but there were lots of displacements; there were huge challenges to social systems."
- "Economic life was improved. Social life became worse off because of comparisons and seeing only the best part of other people's lives. Political life will be more transparent – corruption will come to light quickly."

The internet could eventually lead to technology's overthrow of humanity

Several participants in this study wrote that technology will prevail over humans in the future.

Marc Brenman, managing partner at IDARE LLC, said, "History will be written by machines, which will praise themselves."

An emeritus professor of computer science at a major California university commented, "We need to distinguish technologies of connectivity from technologies of future superior intelligence and consciousness. General artificial intelligence (GAI) is an existential

threat… Once GAI surpasses human capabilities GAI systems will use the internet to take control of humanity. The internet is a tool and can be used, like any tool, for good or evil purposes. In contrast, GAI will not be a tool; it will be an autonomous entity and, ultimately, a competitor to humanity (and to all other biological forms of life, since GAI systems will not be based on biological metabolic processes). Freedom from biology will allow GAI synthetic systems to travel to the stars so, in the long run, humans will be left behind. The real question is: How long can humans delay the inevitable? The longer the better, if you happen to be human."

Frank Tipler, a mathematical physicist at Tulane University, commented, "The answer depends on whether there are human-level AIs in 50 years. If there are, historian verdicts are irrelevant."

Steven Thompson, editor of "Androids, Cyborgs and Robots in Contemporary Culture and Society," wrote that historians will see the internet as leading to, "Disaster. Contributing to the fall of mankind. Sorry, but I wax apocalyptic, and the internet is at the heart of it."

Frank Feather, futurist and consultant with StratEDGY, sees the coming together of humans and technology as a partnership. He wrote, "Future historians will be different from previous human historians because we will be entering a DigiTranshuman society. These historians will take a more comprehensive and unbiased view of history and will view it within a futuristic context of change and evolution. They will acknowledge its stumbles, but also point out how the foundation has been set for a full DigiTranshuman society to evolve fully by 2100."

The development of the internet will not seem that significant to historians of 2069

A small share of correspondents said the internet will not loom as large to historians of 2069 as other aspects of the current era or it will be such a natural aspect of life that it isn't seen as a key topic on which to report.

Jim Spohrer, director of the Cognitive Opentech Group at IBM Research-Almaden, commented, "They will say it was just another technology."

Mark Crowley, a core member of the Institute for Complexity and Innovation at the University of Waterloo, Ontario, Canada, wrote, "This period will be seen a merely the first stage of coming to awareness, like a 3-year-old just starting to figure itself out and running into problems. They will find it hard to fathom how changes happened because they will not understand the time before the internet."

An anonymous respondent wrote, “Historians in the future will look at it as a small move. They will be more interested in the architecture that we are laying down that may or may not become essential to the future of the internet.”

A well-known writer and editor who documented the early boom of the internet in the 1990s wrote, “Rather like electricity is to us today, it will be hard to imagine anything like modern life without it, and so it will be hard for them to pass any judgment beyond ‘inevitable.’”

An anonymous respondent who worked for a pioneering internet company commented, “They will not be able to imagine that anything different could have happened. Once things change, they become ‘progress.’”

Alexey Turchin, existential risks researcher at Foundation Science for Life Extension, responded, “The internet will probably go unnoticed and be less discussed than the things it connects, like AI, bits, Bitcoin, smaller networks, etc.”

Future historians might not be well-informed about the early 2000s due to ‘digital decay’

One of today’s digital concerns – the fact that while vast amounts of information are being created they are generally not being retained in a form that is certain to be readable a decade or two hence due to the rapid evolution of communications format – was pointed out by several participants in this study.

Thad Hall, a research scientist and coauthor of “Politics for a Connected American Public,” wrote, “I doubt the ability of historians to get certain types information 50 years from now about today. Historians have used letters and other documents for their work. When my letters are in a Gmail account that dies with me how will this research be done? And will there be Twitter or Facebook archives that can be searched 50 years from now? I doubt it.”

An anonymous respondent said, “[Historians will say that this generation generated] a vast amount of instant data but all that data resulted in the worst-documented period of the last thousand years because data is transient and users are recommended to delete old material.”

The co-founder of an online civil liberties organization based in the Silicon Valley wrote, “Who knows? Will enough internet history be saved to enable historians to reach a verdict?”

An internet cybercrime and security consultant based in Europe wrote, "They will look at and comment on a period of tremendous transition, but only IF we manage to store digital data successfully even after systems are terminated or changed."

One disagreed, saying that humans will have more data about this historic period than about any other previous era.

Mike Meyer, chief information officer at Honolulu Community College, said, "The historians' view of the first 75 years of the internet will be that for the first time we have a detailed history of a fundamental paradigmatic change in human civilization. The arguments will be on the overall impact of the resulting definition of humanity's view of the universe. Currently the assumption has become that this is on the level of the scientific revolution in Western Europe, but it may be in 50 years that it will be seen as closer to the Neolithic transition."

Will there be any historians 50 years from now?

Some participants in this canvassing weren't sure there will be historians in the future. Some said there won't be a wealth of useful data for them to study.

A computer scientist commented, "I don't believe society will be able to support historians' writing in 2069."

A digital rights activist commented, "I'll be happy if we have historians 50 years from now and manage not to bomb ourselves into oblivion."

A professor of computer science expert in systems wrote, "The traditional role of historians is to record the facts that define history. The internet and the information infrastructure built on it in 50 years may have rendered historians' traditional role obsolete. Their new role might be to distinguish facts from disinformation, all from the vast sea of data being generated and stored around the internet."

Danny Gillane, a netizen based in Louisiana, said, "I don't think we will have any historians in 50 years. Those who write what looks vaguely like what we consider history will have grown up knowing only a world with the internet and smart devices, a world where the loudest people drown out the multitudes. How can they realistically judge the impact of the internet?"

A retired program director for the U.S. National Science Foundation wrote, "It is quite possible there will be no *human* historians left."

In conclusion:
Wide-ranging comments from the experts

Betsy Williams, a researcher at the Center for Digital Society and Data Studies at the University of Arizona, wrote, "Historians will say the optimistic and libertarian ideals built into early internet communities were not automatically self-sustaining. Political and economic pressures shaped the internet; notable examples include the end of America's net neutrality policy, the Great Firewall of China and Russian interference in other countries' elections. Coalitions of internet users and civil libertarians engaged in constant advocacy and lawsuits, targeting governments and the dominant corporations of the time, including Amazon, Facebook, Google and Microsoft. These coalitions and the alternative 'open' structures they built maintained various portions of the internet as public spaces, places where users had rights, or places of anonymity."

Jeff Jarvis, director of the Tow-Knight Center at City University of New York, commented, "We are still arguing about the influence of movable type and the book almost six centuries after their introduction. You can bet that in 50 years, historians will have no verdict, only an argument."

João Pedro Taveira, embedded systems researcher and smart grids architect for INOV INESC Inovação, Portugal, said he expects that historians will say of today's internet, "It was an indomitable, uncontrolled and unbridled beast. The internet has changed people's lives so much that we may be unable to keep up."

Eileen Donahoe, executive director of the Global Digital Policy Incubator at Stanford University, commented, "Historians' verdict about the impact of the internet on people's social, economic and political lives will depend on whether or not we find a way to distribute the economic value that flows from the internet more widely in the next generation."

John Lazzaro, retired professor of electrical engineering and computer science, University of California – Berkeley, commented, "When historians look back on 1968-2018, the internet won't make the top-three list of highest-impact changes during that time. A tribute to Neil Armstrong upon his passing said it best: 'As long as there are history books, Neil Armstrong will be included in them.' The Apollo program will top the list, and list items two and three will be judged relative to it. And if you take a moment to think of the contenders for the other slots (for example, the advent of modern family planning and its social and demographic consequences), you may be surprised to find that the internet falls off of your own list of candidates as well."

Mechthild Schmidt Feist, department coordinator for digital communications and media at New York University, said, "Our time will be seen as a parallel to the first wave of media/transportation/political innovation at the start of the 20th century: creative and

innovative with an almost naive utopian-optimistic outlook in a hyper-capitalist environment not seeing the writing on the wall. We will be the generation that had science and computer models of our climate but, instead of seeing the big picture and using our knowledge to phase out fossil fuels and innovate resource use, we went for the self-indulgence of hyper-consumption of ever-new gadgets. With stock profits driving all decisions, a responsible plan for the next generations was never implemented. If our civilization survives those in the future will not judge us kindly since we cannot claim a lack of knowledge."

Leonard Kleinrock, the co-director of the first host-to-host online connection, professor of computer science, University of California – Los Angeles, said, "In 50 years historians will look back and recognize that a revolution occurred in the internet's first 50 years that significantly impacted social interaction. It allowed an individual to reach out to countless others, seamlessly, instantly, at essentially no cost in money or effort, and, at times, anonymously. This was a formula for greatly expanded interaction, commerce and curiosity. At the same time this was a perfect formula for the dark side. Perhaps in 50 years we will be in a position to form a proper judgment as to the nature of its value to humanity."

Joseph Potvin, executive director at the Xalgorithms Foundation – creating specifications and components for an "Internet of Rules" – responded, "They'll say, 'Bateson's cybernetic vision only really began to take form in 2020 when…"

Ed Lyell, longtime internet strategist and professor at Adams State University, asked, "By 2069 will we have changed the 2018 direction of the internet away from the concentrated power of a small number of very large for-profit corporations? Will we have created governance and business models that enhance the quality and access of the internet for the masses, or will we have just left it only for the wealthy urban dwellers. Historians will report the answers to these questions, and in their review we can judge whether the internet has been good or bad, and for whom."

About this canvassing of experts

The expert predictions reported here about the impact of the internet over the next 50 years came in response to questions asked by Pew Research Center and Elon University's Imagining the Internet Center in an online canvassing conducted between July 4, 2018, and Aug. 6, 2018. This is the 10th Future of the Internet study the two organizations conducted together. This brief report is a small spinoff of a much larger report issued by Pew Research and the Imagining the Internet Center on Oct. 29, 2019 as a tip of the cap to the 50th anniversary of the first host-to-host connection of the ARPANET, the precursor to the global internet.

Nearly 10,000 experts and members of the interested public were invited in the summer of 2018 to share their opinions on two big-picture questions: 1) the likely future of artificial intelligence and humans, and 2) the ARPANET's 50th anniversary. The first report, "Artificial Intelligence and the Future of Humans," was published December 10, 2018. This brief report is a small spinoff of a much larger "Next 50 Years" report issued simultaneously on Oct. 29, 2019 by Pew Research and the Imagining the Internet Center. It is based on one of five follow-up questions respondents were asked about the next 50 years of the internet.

The question:

> *The year 2019 will mark the 50th anniversary of the first host-to-host connection. Please think about the next 50 years.* ***What will historians' verdict be 50 years from now about the impact of the internet on people's social, economic and political lives today?***

The web-based instrument was first sent directly to a list of targeted experts 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 this particular research topic were also added to the list. Among those invited were researchers, developers and business leaders from leading global organizations, including Oxford, Cambridge, MIT, Stanford and Carnegie Mellon universities, Google, Microsoft, Facebook, Amazon, BT and Cloudflare; inductees to the Internet Hall of Fame, most of whom played key roles in the invention and diffusion of the internet; 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). We also invited a large number of professionals and policy people from technology businesses; government, including the National Science Foundation, Federal Communications Commission and European Union; think tanks and interest networks (for instance, those that include professionals and academics in anthropology, sociology, psychology, law, political science 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. 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 are 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.*

About a third 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 where relevant in this report.

Overall in the canvassing of experts in which Elon and Pew asked about AI and the future of humans and asked questions tied to the Internet's 50th Anniversary 519 respondents answered the demographic questions. About 70% identified themselves as being based in North America, while 30% hail from other corners of the world. When asked about their "primary area of internet interest," 33% identified themselves as professor/teacher; 17% as research scientists; 13% as futurists or consultants; 8% as technology developers or administrators; 5% as entrepreneurs or business leaders; 5% as advocates or activist users; 4% as pioneers or originators; 1% as legislators, politicians or lawyers; and an additional 13% specified their primary area of interest as "other."

A selection of institutions at which some of the respondents work or have affiliations: Abt Associates; Access Now; Aeon; Allen Institute for Artificial Intelligence; Alpine Technology Group; Altimeter Group; American Institute for Behavioral Research and Technology; American Library Association; Antelope Consulting; Anticipatory Futures Group; Arizona State University; Artificial Intelligence Research Institute, Universitat Autònoma de Barcelona; Aspen Institute; AT&T; Australian National University; Bad Idea Factory; Bar-Ilan University, Israel; Bloomberg Businessweek; Bogazici University, Turkey; Brookings Institution; BT Group; Business Futures Network; California Institute of Technology; Carnegie Mellon University; Center for Advanced Study in the Behavioral Sciences, Stanford University; Centre for Policy Modelling, Manchester Metropolitan University; Centre National de la Recherche Scientifique, France; Cisco Systems; Clemson University; Cloudflare; Columbia University; Comcast; Constellation Research; Cornell University; Corporation for National Research Initiatives; Council of Europe; Agency for Electronic Government and Information Society in Uruguay; Electronic Frontiers Australia; Electronic Frontier Foundation; Emergent Research; ENIAC Programmers Project; Eurac Research, Italy; FSA Technologies; Farpoint Group; Foresight Alliance; Future of Privacy Forum; Future Today Institute; Futurism.com; Gartner; General Electric; Georgia Tech; Ginkgo Bioworks; Global Forum for Media Development; 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 Defense

Analyses; Institute for the Future; Instituto Superior Técnico, Portugal; Institute for Ethics and Emerging Technologies; Internet Engineering Task Force (IETF); International Academy for Systems and Cybernetic Sciences; Internet Society; Institute for Communication & Leadership, Lucerne, Switzerland; Johns Hopkins University; Kansai University, Japan; Institute for Systems and Robotics, University of Lisbon; Institute of Electrical and Electronics Engineers (IEEE); Kernel; Kyndi; Knowledge and Digital Culture Foundation, Mexico; KPMG; Leading Futurists; LeTourneau University; The Linux Foundation; Los Alamos National Laboratory; Machine Intelligence Research Institute; Massachusetts Institute of Technology; Maverick Technologies; McKinsey & Company; Media Psychology Research Center; Microsoft; Millennium Project; Monster Worldwide; Mozilla; Nanyang Technological University, Singapore; National Chengchi University, Taiwan; National Institute of Mental Health; NetLab; The New School; New York University; Netflix; NLnet Foundation; NORC at the University of Chicago; Novartis, Switzerland; Organization for Economic Cooperation and Development; Ontario College of Art and Design Strategic Foresight and Innovation; Open the Future; Open University of Israel; Oracle; O'Reilly Media; Global Cyber Security Capacity Center, Oxford University; Oxford Internet Institute; Packet Clearing House; People-Centered Internet; Perimeter Institute for Theoretical Physics; Politecnico di Milano; Princeton University; Privacy International; Purdue University; Queen Mary University of London; Quinnovation; RAND; Research ICT Africa; Rochester Institute of Technology; Rose-Hulman Institute of Technology; Russell Sage Foundation; Salesforce; SRI International; Sciteb, London; Shinkuro; Significance Systems; Singapore Management University; Sir Syed University of Engineering and Technology, Pakistan; SLAC National Accelerator Laboratory; Södertörn University, Sweden; Social Science Research Council; University of Paris III: Sorbonne Nouvelle; South China University of Technology; Stanford University; Straits Knowledge; Team Human; The Logic; Technische Universität Kaiserslautern, Germany; Tecnológico de Monterrey, Mexico; The Crucible; United Nations; University of California, Berkeley; University of California, Los Angeles; University of California, San Diego; University College London; University of Denver Pardee Center for International Futures; Universitat Oberta de Catalunya; Universidade NOVA de Lisboa, Portugal; the Universities of Alabama, Arizona, Delaware, Florida, Maryland, Michigan, Minnesota, Pennsylvania, Southern California, Utah and Vermont; the Universities of Calcutta, Cambridge, Cologne, Cyprus, Edinburgh, Granada, Groningen, Liverpool, Otago, Pavia, Salford and Waterloo; UNESCO; USENIX Association; U.S. Department of Energy; U.S. Naval Postgraduate School; U.S. Special Operations Command SOFWERX; Vision & Logic; Vizalytics; World Wide Web Foundation; Wellville; Wikimedia; Yale Law School Information Society Project.

Complete sets of credited and anonymous responses can be found here:
https://www.elon.edu/u/imagining/surveys/x-3-internet-50th-2019/full-responses/

Acknowledgments

The Imagining the Internet team is grateful for the contributions of the people who participated in this canvassing. We are also extremely thankful to the people of Pew Research and Lee Rainie, Internet and Technology Director with Pew, for our longtime partnership in this research. And thanks to Alexa Boschini, assistant director of publications at Elon University, for copy editing assistance.