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The Future of the Internet II: New Pew Internet/Elon University study looks ahead to 2020

Technology builders, entrepreneurs, consultants, academicians and futurists from around the world share their newest observations about key issues in "The Future of the Internet II," a survey conducted by the Pew Internet & American Life Project and Elon University.

Nearly 750 people submitted their ideas about the impacts networked technologies may have on world societies by 2020. Among the themes in the predictions: continued serious erosion of individual privacy, the improvement of virtual reality and problems associated with ever-more-compelling synthetic worlds, greater economic opportunities for those in developing nations, changes in languages and the rise of autonomous machines that operate beyond human control.

The release of the report coincides with the first OneWebDay, Sept. 22, a celebration of the human collaboration and connection the internet makes possible. Download the full report in pdf format at: www.elon.edu/e-web/predictions/2006survey.pdf

"The people who look over the horizon are a pretty contentious group," said Lee Rainie, Director of the Pew Internet & American Life Project. "Many know from history and personal experience that technologies can have good and bad effects. You can see them toting up the pluses and minuses in their answers. I come away with a sense that the future is still up for grabs, even as everyone agrees that it will be very different from today."

"People responding to the survey expressed deep concern over who controls internet architecture," said the report's principal author Janna Quitney Anderson, director of the Imagining the Internet project (www.imaginingtheinternet.org) and assistant professor of communications at Elon University. "They also expressed the incredibly deep feelings of connection they experience when using this unrivaled communications tool. They see it as a way for the world to benefit from collaboration, creativity and the wisdom of crowds, but they also see it as a disruptive technology that will bring significant changes – some negative – throughout human networks."

Researchers at the Pew Internet Project and Elon University's School of Communications conducted the survey of internet luminaries and builders from November 2005 to April 2006. This second survey follows a January 2005 report that detailed forecasts by technology experts about the next decade of Internet development.

"The Future of the Internet II" asked selected participants to react to variety of networked information technology scenarios related to national boundaries, human languages, artificial intelligence and other topics. Among the questions implicit in the scenarios were: Will more people choose to live "off the grid"? Will autonomous machines leave people out of the loop? Will English be the lingua franca? Will national boundaries be displaced by new groupings? Following is a brief selection of a few of the most provocative future visions shared by respondents to the survey scenarios – these do not represent majority views.

Privacy

"We are constructing architectures of surveillance over which we will lose control. It's time to think carefully about 'Frankenstein,' The Three Laws of Robotics, 'Animatrix,' and 'Gattaca.'" – **Marc Rotenberg**, executive director of the Electronic Privacy Information Center

"Privacy is a thing of the past. Technologically it is obsolete. However, there will be social norms and legal barriers that will dampen out the worst excesses." – **Hal Varian**, University of California-Berkeley and Google

"Before 2020, every newborn child in industrialized countries will be implanted with an RFID or similar chip. Ostensibly providing important personal and medical data, these may also be used for tracking and surveillance." – **Michael Dahan**, a professor at Sapir Academic College in Israel

"A system with too much public-domain info about individuals will limit the type of people who enter politics to those who grew up in convents and abbeys." – **James Schultz**, principal partner, Pretty Good Consulting

Language

"English will be a prominent language on the internet because it is a complete trollop willing to be remade by any of its speakers (after all, English is just a bunch of mispronounced German, French, and Latin words). ... That said – so what? Chinese is every bit as plausible a winner. Spanish, too. Russian! Korean!" – **Cory Doctorow**, blogger and co-founder of Boing Boing

"English will not displace or replace the other major languages in the world, including French, Spanish, Japanese, Germanic, Hindu, etc. It is likely that English will become (as it already has in most domains) lingua franca, and a requirement that everybody learn English as a second language to have a common language to communicate with." - **Stewart Alsop**, investor and analyst; former editor of InfoWorld and Fortune columnist; internet user since 1994

"Of course, a lot of 2020 English will sound Mandarinish." - **Bob Metcalfe**, Ethernet inventor, founder of 3Com Corporation, former CEO of InfoWorld, now a venture capitalist and partner in Polaris Venture Partners; internet user since 1970

"It seems paradoxical that the Internet can be a powerful force for memorializing and evangelizing local languages and cultures and differences and still lead to a great homogenization as the thirst for knowledge leads one invariably into Chinese and English. In 2020, many more people will be bilingual, with a working web-interaction knowledge of English to go with their native tongue." - **Glenn Ricart**, executive director, Price Waterhouse Coopers Advanced Research; member of the board of trustees of the Internet Society; internet user since 1968

Control of the internet

"I do not see a commitment from national legislatures and from international bodies to control commercial exploitation of networks ... Global regulation of networks that privileges public good over commercial reward must occur." – **Andy Williamson**, *managing director of Wairua Consulting, New Zealand*

"Profit motives will impede data flow ... Networks will conform to the public utility model, with stakeholders in generation, transmission, and distribution. Companies playing in each piece of the game will enact roadblocks to collect what they see as their fair share of tariff revenue." – **Peter Kim**, *senior analyst, Forrester Research*

"The information age needs the flow of ideas, the political form always follows the economic need. We will see a flattening of the nation-state in Western society. In third-world countries and networks of ethnic grouping such as the Arab world, we will see a desperate attempt to hold onto the framework as is." – **Amos Davidowitz**, *Institute of World Affairs*

"By becoming a valuable infrastructure, the internet itself will become a target. For some, the motivation will be the internet's power (and impact), for others it will just be a target to disrupt because of potential impact of such a disruption." – **Thomas Narten**, *IBM and the Internet Engineering Task Force*

"We really need a series of well-supported, lower-level watchdog organizations to ensure that ICTs are not utilized by those in power to serve the interests of profit at the expense of human rights." – **Lynn Schofield Clark**, *director of the Teens and the New Media @ Home Project at the University of Colorado*

Automated technology

"If you look at [autonomous technology and] the way products are currently developed and marketed, you'd have to say human beings have been taken out of the equation. Human intervention will soon be recognized as a necessary part of developing and maintaining a society." – **Douglas Rushkoff**, *author, social commentator and teacher*

"Fear of enslavement by our creations is an old fear, and a literary tritism. But I fear something worse and much more likely – that sometime after 2020 our machines will become intelligent, evolve rapidly, and end up treating us as pets. We can at least take comfort that there is one worse fate – becoming food – that mercifully is highly unlikely." – **Paul Saffo**, *forecaster and director of The Institute for the Future*

"The more autonomous agents the better. The steeper the 'J curve' the better. Automation, including through autonomous agents, will help boost standards of living, freeing us from drudgery." – **Rob Atkinson**, *Progressive Policy Institute*

Virtual reality

"While area codes might still define geographic locations in 2020, reality codes may define virtual locations. Multiple personalities will become commonplace, and cyberpsychiatry will proliferate." – **Daniel Wang**, *principal partner, Roadmap Associates*

"In 2020, it may no longer be 'screens' with which we interact. What I mean by 'screen time' in 2020 is time spent thinking about and interacting with artificially-generated stimuli. Human-to-human non-mediated interaction counts as 'face time' even if you do it with a telephone or video wall." – **Glen Ricart**, *Internet Society board member, formerly of DARPA*

"A human's desire to reinvent himself, live out his fantasies, overindulge, addiction will definitely increase. Whole communities/subcultures, which even today are a growing faction, will materialise. We may see a vast blurring of virtual/real reality with many participants living an in-effect secluded lifestyle. Only in the online world will they participate in any form of human interaction." – **Robert Eller**, *technology consultant*

"Instead of dealing with the challenges and fears of teen-identity definition, more and more youth are creating multiple 'virtual' personalities and losing themselves to each of those game scenarios ...Do we end up with much more mature, experientially compassionate people, or even more anxious, fearful, and disassociative personalities? It seems that even minimal intervention at appropriate stages of virtual personality creations could dramatically improve positive over negative long-term outcomes." – **Ed Lyell**, *internet education expert*

Collaboration

"These technologies allow us to find cohorts that eventually will serve to decrease mass shared values and experiences. More than cultural fragmentation, it will aid a fragmentation of deeper levels of shared reality." – **Denzil Meyers**, *founder and president of Widgetwonder*

"Behavior is the function of learning, and the networks shall be the common source of learning, a common platform where all netizens stand equal." – **Alik Khanna**, *Smart Analyst Inc., India*

"The greater the gap between the digital haves and have-nots, the greater the tension ... We can imagine the UN (and Bono?) organizing 'upgrades' for countries with a disproportionate number of digitally disadvantaged people." – **Ralph Blanchard**, *information services entrepreneur and investor*

"Corporation-based cultural groupings may actually be one of the most destructive forces if not enough cultural, relational, and bottom-up social forces are built up. This does not detract from the prediction that a lot more people than today will have a good life through extensive networked collaboration." – **Alejandro Pisanty**, *vice chairman of the board for ICANN and CIO for the National University of Mexico*

The participants and methodology

Many top internet leaders, activists, and commentators participated in the survey, including David Clark, Gordon Bell, Esther Dyson, Fred Baker, Scott Hollenbeck, Robert Shaw, Ted Hardie, Pekka Nikander, Alejandro Pisanty, Bob Metcalfe, Peng Hwa Ang, Hal Varian, Geert Lovink, Cory Doctorow, Anthony Rutkowski, Robert Anderson, Ellen Hume, Howard Rheingold, Douglas Rushkoff, Steve Cisler, Marilyn Cade, Marc Rotenberg, Alan Levin, Eugene Spafford, Veni Markovski, Franck Martin, Greg Cole, Paul Saffo, Thomas Narten, Alan Inouye, Seth Finkelstein, Teddy Purwadi, Luc Faubert, John Browning and David Weinberger, to name just a few.

Participants include people from VeriSign, BBN Technologies, Yahoo Japan, France Telecom, the International Telecommunication Union, Nanyang Technological University, the Electronic Frontier Foundation, MIT, AfriNIC, Qualcomm, Electronic Privacy Information Center, Nortel, Disney, Harvard, RAND, IBM, Princeton, Sony, Google, Telematica Instituut, Habitat for Humanity, Cisco, Greenpeace, AT&T, Jupiter Research, CNET, Microsoft, Intel, Amazon.com, Sprint, Intuit, HP Laboratories, Centre for Policy Modelling, ICT Strategies, Bipolar Dream, the Benton Foundation, Semacode, Warner, Hearst, Adobe Systems, Forrester Research and many other top groups. Respondents were asked to agree or disagree with each of a set of eight scenarios, and they were given the opportunity to elaborate on their answers. The scenarios – woven from data collected in recent industry and research reports and predictive public statements by leaders in science, technology, business, and politics – were designed to spur discussion.

Among specific findings of this non-random survey are the following:

- **57% said English** will not crowd out other languages on the internet. English will not become the dominant language of the internet, crowding others into obscurity; instead as the internet continues to be improved and appears in future language-spanning forms it will help people preserve and use their regional dialects while still communicating globally.
- **58% said people who don't participate** in digital communications networks will form their own cultural group that self-segregates from "modern" society. Resistance to technological change may inspire some acts of violence, but most struggles will still be inspired by politics and economics, and many people will remain unconnected due to these. Some people will choose to be off the network – all the time (going totally "off the grid") or sometimes.
- **56% said online virtual reality will lead to some addiction problems.** Those who are connected online will spend more time immersing themselves in more-sophisticated, networked synthetic worlds; while this will foster productivity and connectedness and be an advantage to many, it will lead to addiction problems for some.
- **54% said autonomous networked technology** (robots, control systems, etc.) will not move beyond human control by 2020, and it does not raise concern; the humans who are wielding technology in search of wealth and power are, however, seen by many respondents as likely to cause serious concerns.

- **46% agreed and 49% disagreed with the proposal that by 2020 transparency** (brought by networked communications sensing and storage) will build a better world despite a loss of privacy. Most respondents said some level of privacy must be protected, either by law or by social contract. They expect that governments and corporations will escalate surveillance and "own" access to information; the powerful/privileged will find growing transparency more to their advantage than others in society.
- **78% identified building network capacity and the knowledge base** to help people of all nations use it as the first or second priority for the world's policymakers and the technology industry to pursue.

The online internet predictions survey was conducted by Princeton Survey Research Associates. Since it is a non-random sample, a margin of error cannot be computed. Full results of the survey, including engaging quotes from hundreds of respondents and brief biographies on many of these people, can be found on the Web at www.imaginingtheinternet.org by using the "Predictions Surveys" link. Visitors to the site are invited to share their own visions for the future of the Internet in the section of the site labeled "Voices of the People" (www.elon.edu/predictions/RecentPredictions.aspx).

For more information about the Internet Society's OneWebDay, consult the OneWebDay wiki (www.onewebday.org/wiki/index.php/Main_Page) for collaborating on projects.