

THE FUTURE OF THE INTERNET 2010 SURVEY RESULTS

Lee Rainie, lrainie@pewinternet.org
Director – Pew Internet Project
and Janna Anderson, andersj@elon.edu
Director – Imagining the Internet Center

Twitter: [@lrainie](https://twitter.com/lrainie) and [@jannaq](https://twitter.com/jannaq)

WorldFuture 2010
Boston, USA
7.9.10

The internet is the change agent

Then and now

2000

46% of adults use internet

5% with broadband at home

50% own a cell phone

0% connect wirelessly

<10% use “cloud”

0% = tech social networkers

THEN: slow, stationary
connections built around my
computer

2010

79% of adults use internet

64% have broadband at home

82% own a cell phone

59% connect wirelessly

>two-thirds use “cloud”

48% = tech social networkers

NOW: faster, mobile
connections built around outside
servers and storage

Futurism 101 – the technology side

- **Computing capacity:** The price/performance ratio of computing hardware doubles every 18-24 months (Moore's Law)
- **Bandwidth capacity:** Doubles every two years in wired environment (Gilder's Law and Nielsen's Law)
 - Doubles every 2.5 years - wireless (Cooper's Law).
- **Digital storage capacity:** Doubled every 23 months since 1956 (Kryder's Law)
- **Others:** miniaturization, density of graphical displays, file compression, sensor/RFID proliferation

Futurism 101 – the operating/apps side

- Search improvements
 - Relevance – quality information
 - Real-time
 - Relatedness
- Expansion of local awareness
- Conversational user interface
- Translation improvements
- “Social graph” expansions and nuances
- Rise of the “internet of things”



Janna Anderson

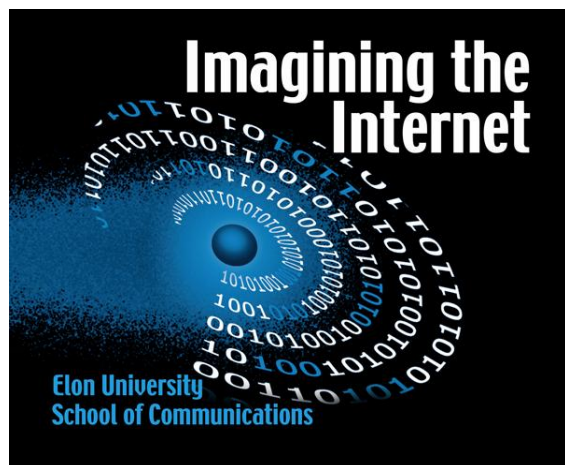
Foresight work through horizon assessment and scenario discussions – CSTB, Metaverse

- CSTB presentations in a nutshell: Technological development will lead us to astounding and the emergence of efficiency increases and the emergence of highly effective and largely invisible wearable and ubiquitous computing, sensing, effecting and communication systems - an influential force in coming decades.
- Tomorrow's Geoweb, telepresence systems, mirror worlds, social networks and AI developments will combine with expected breakthroughs in neuroscience and bioinformatics. It is challenging and exciting to imagine where we are headed.

From the Metaverse Roadmap – report led by John Smart, Jamais Cascio, J. Paffendorf, et al.

- Metaverse Roadmap report was a look at the nexus of our physical and virtual worlds looking toward 2017-2025. Inputs were solicited in **four topic areas**: Industry Conditions, Forecasts, Issues and Questions, and Problems and Indicators. Each was divided into **19 categories**, from History to Progress Indicators. Each was also considered in **three subcategories**: Technology and Science, Business and Economics, or Social, Legal and Other domains. (This is an adaptation of the Foresight Framework Model of Dr. Peter Bishop, chair of futures studies masters program at the University of Houston.)
- All of the details are available online at www.metaverseroadmap.org

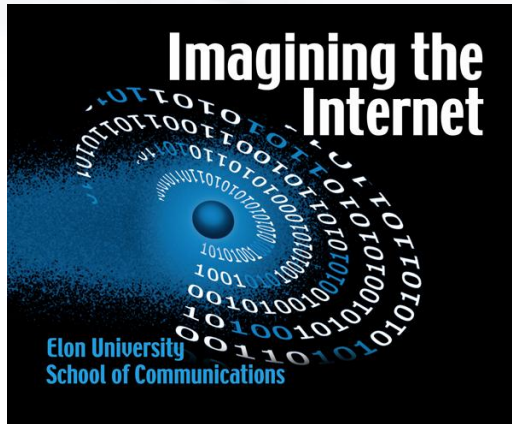
Imagining the Internet – Elon University



<http://www.elon.edu/predictions/>

- The **Future of the Internet** surveys are part of a larger project, **www.imaginingtheinternet.org**, a futures site that offers a history and forecast of the internet.
- It showcases 2004, '06, '08 and '10 Future of the Internet surveys
- Additional elements include early 1990s predictions, videos, lesson plans for teachers, a children's section, and a submission form you can use to share your own predictions about the future of the internet.

About the Future of the Internet surveys



- Led by Lee Rainie of Pew Internet and Janna Anderson of Elon U. We issue our reports free online. Books pub. by Cambria Press
- Respondents - Experts in Early '90s Predictions Database. New invitees (high-tech organizations, etc.) Pass-along recommendations, and “friends of Pew Internet” – surveys not a scientific sample
- We pose scenarios in order to inspire detailed elaborations – more voices making more predictions

PewResearchCenter



Survey 1 – 2004



<http://www.elon.edu/predictions/>

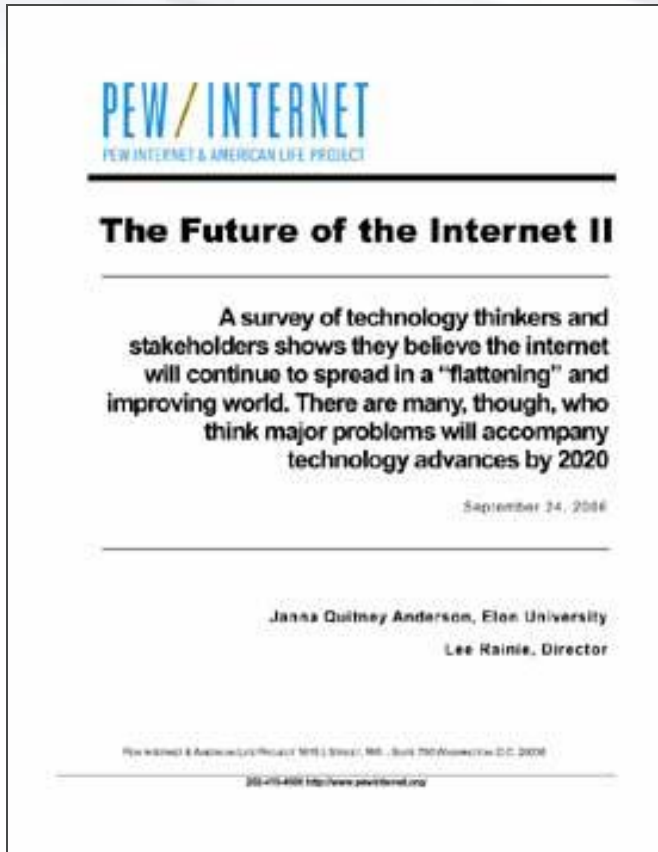
Hits (impact by 2014)

- News organizations and publishing would be slammed
- Health, Ed systems not expected to change radically by 2014
- Online security would be a growing problem and attacks increase

Surprises

- Awed by rise of web, search engines, and P2P
- Disappointed by lack of change so far in schools and digital divides

Survey 2 – 2006



Hits (impact by 2020)

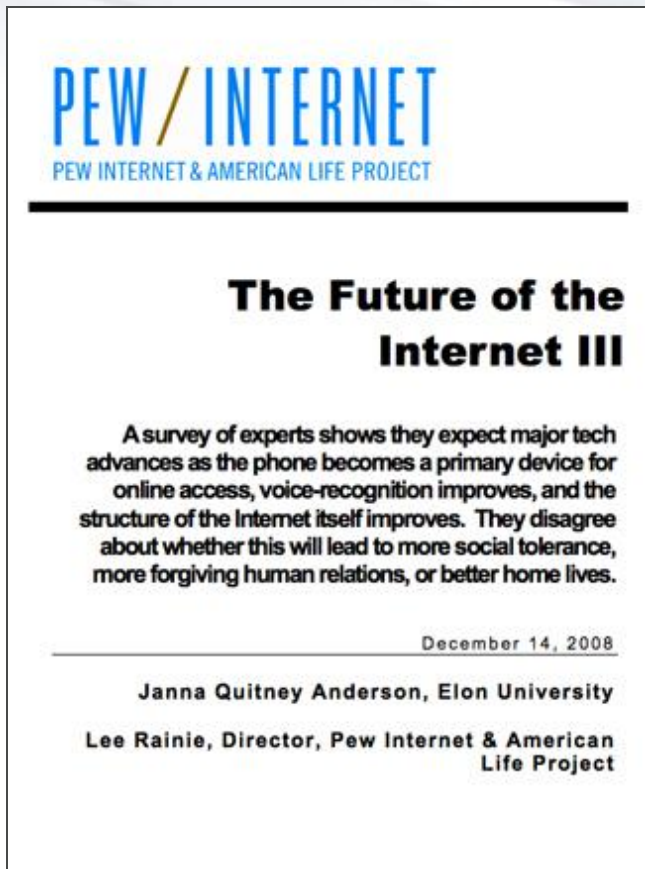
- Virtual reality will come to allow more productivity but at some human cost – slight majority agreed – 56 percent agreed and 39 disagreed

No consensus

- Benefits of transparency will make the world a better place by 2020 – 46 percent agreed and 49 percent disagreed

<http://www.elon.edu/predictions/>

Survey 3 – 2008



PEW / INTERNET
PEW INTERNET & AMERICAN LIFE PROJECT

The Future of the Internet III

A survey of experts shows they expect major tech advances as the phone becomes a primary device for online access, voice-recognition improves, and the structure of the Internet itself improves. They disagree about whether this will lead to more social tolerance, more forgiving human relations, or better home lives.

December 14, 2008

Janna Quitney Anderson, Elon University
Lee Rainie, Director, Pew Internet & American Life Project

<http://www.elon.edu/predictions/>

Hits (impact by 2020)

- 77% said mobile devices to be primary connection
- 64% support advanced UI talk and touch – some add “think”
- 60% said IP control not likely
- 56% agree work/personal line blurs and “that’s OK.”

No consensus

- Transparency would lead to more personal integrity and forgiveness – 45-44

Survey 4 – 2010 – 10 questions

895 respondents

- 371 past participant experts
- 524 new recruits and friends
 - 15% research scientists/scholars
 - 14% business leaders or entrepreneurs
 - 12% consultants or futurists
 - 12% authors, editors or journalists
 - 9% technology developers or administrators
 - 7% advocates or activists
 - 3% pioneers or originators
 - 2% legislators, politicians or lawyers
 - 25% specified themselves as “other”



The Future of the Internet

Experts and stakeholders say the Internet will enhance our intelligence – not make us stupid. It will also change the functions of reading and writing and be built around still-unanticipated gadgetry and applications. The battle over control of the internet will rage on and debates about online anonymity will persist.

Janna Quintney Anderson, Elon University
Lee Rainie, Pew Internet & American Life Project
February 19, 2010

Pew Research Center's Internet & American Life Project
An initiative of the Pew Research Center
1615 L St., NW – Suite 700
Washington, D.C. 20036
202-419-4500 | pewinternet.org

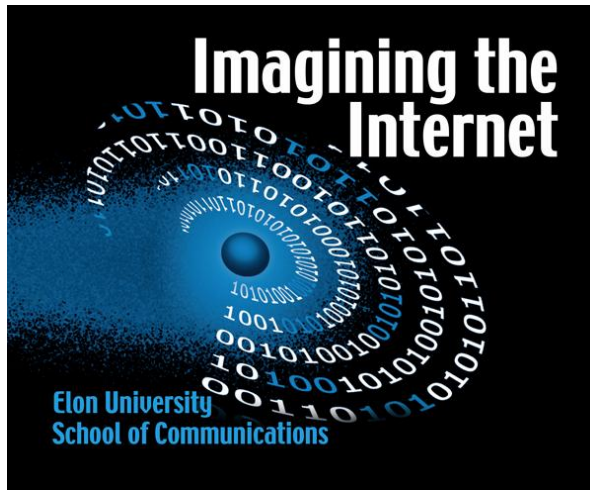
THE FUTURE OF THE INTERNET

This publication is part of a Pew Research Center series that captures people's expectations for the future of the Internet, in the process presenting a snapshot of current attitudes. Find out more at:
<http://www.pewinternet.org/topics/future-of-the-internet.aspx> and
<http://www.imaginingtheinternet.org>

<http://www.elon.edu/predictions/>

Question strategy change

- Tension pairs – force choice between two opposing statements
- Inspires deep narrative elaborations
- Pairs based on common, published attitudes being discussed (these are not “our” predictions)



<http://www.elon.edu/predictions/>

Are hot new gadgets and apps evident now?

The image shows a screenshot of the Twitter website interface from around 2010. The top navigation bar includes links for Home, Profile, Find People, Settings, Help, and Sign out. The main content area features a tweet from NASA: "NASA Today's space shuttle mission status briefing will air live on NASA TV at 12:30pm ET." A red arrow points to the retweet icon (two arrows forming a square) with the text "Handy icon for spotting a retweet". Below the tweet, it says "Retweeted by [name] and 2 others" and "Only see retweets from users you follow". A "Close" button is visible. In the background, a tablet computer is shown displaying a keyboard and a social media interface. On the left side, there is a sidebar with a Facebook profile for Amy Weller, including a profile picture and a list of friends.

Are hot new gadgets evident now?

The hot gadgets and applications that will capture the imagination of users in 2020 are pretty evident today and will not take many of today's savviest innovators by surprise.

16% experts

17% full sample

Hot gadgets and apps that will capture the imagination of users in 2020 will often come “out of the blue” and not have been anticipated by many of today's savviest innovators.

81% experts

80% full sample

Themes

- **iPhone, iPhone, iPhone – most common example cited – nobody would have predicted it**
- **Innovation ecosystem will change: bandwidth / processing**
- **There are basic trends evident now that will come to fruition and some groundwork that has been in place for years that will expand to have more impact**
 - The internet of things
 - Proliferation of sensors
 - Growth of mobile connectivity and location-based services
 - Bigger/thinner TVs - 3D displays
 - “Consolidated,” all-purpose gadgets and apps



<http://www.theatlantic.com/doc/200807/google>

The internet and human intelligence

By 2020, people's use of the internet has enhanced human intelligence; as people are allowed unprecedented access to more information, they become smarter and make better choices. Nicholas Carr was wrong: Google does not make us stupid

81% experts

76% full sample

By 2020, people's use of the internet has not enhanced human intelligence and it could even be lowering the IQs of most people who use it a lot. Nicholas Carr was right: Google makes us stupid

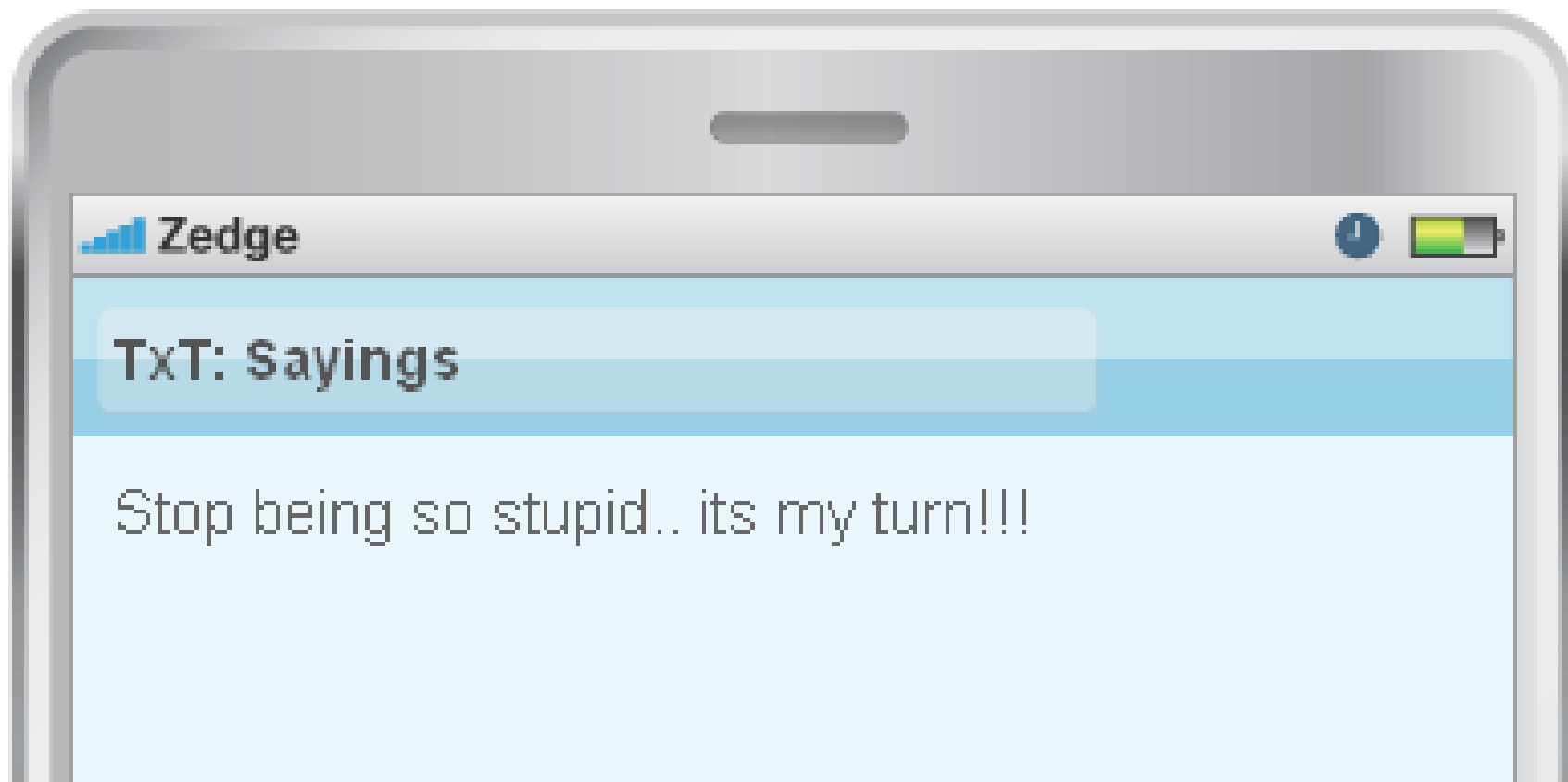
16% experts

21% full sample

Themes

- **Cognitive capacities will shift**
- **New literacies will be required. Fourth “R” will be retrieval.... “Extreme Googlers”**
- **Technology isn’t the problem here. It is people’s inherent character traits**
- **Performance of “information markets” is a big unknown, especially in the age of social media and junk information.... Google will improve**

Impact of the internet on reading, writing, rendering of knowledge?



Impact of the internet on reading, writing, rendering of knowledge?

By 2020, it will be clear that the Internet has enhanced and improved reading, writing, and the rendering of knowledge.

69% experts

65% full sample

By 2020, it will be clear that the Internet has diminished and endangered reading, writing, and the rendering of knowledge.

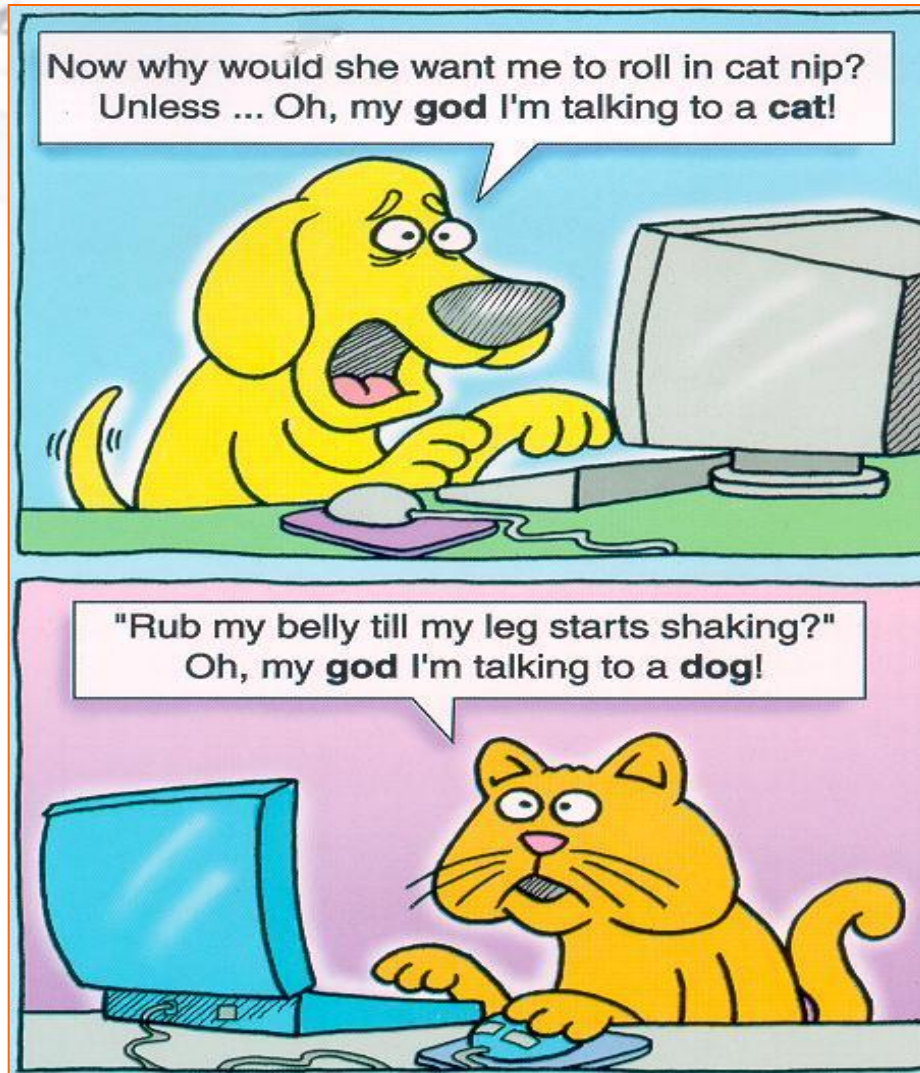
27% experts

32% full sample

Themes

- **People are doing more reading and writing now and that *has* to be better than the alternative - participation breeds engagement**
- **Reading and writing will be different in 10 years; there will be a new fluidity in media creation and “screen” literacy will become important**
- **The nature of writing has changed, especially since so much of it takes place in public, and the quality of the new material will get better thanks to feedback and flammers**
- **Networked information – links and mashups – are changing the creation and consumption process**

What is the future of online anonymity?



What is the future of online anonymity?

By 2020, the ID systems used online are tighter and more formal – fingerprints or DNA-scans or retina scans. The use of these systems is the gateway to most of Internet-enabled activity such as shopping, communicating, creating content, and browsing. **Anonymous online activity is sharply curtailed.**

42% experts

41% full sample

By 2020, Internet users can do a lot of normal online activities anonymously even though the identification systems used on the Internet have been applied to a wider range of activities. **It is still relatively easy for Internet users to create content, communicate, and browse without publicly disclosing who they are.**

54% experts

55% full sample

Themes

- **The law and new regulations will give people some privacy protections even though they are required to disclose more**
- **There are still sufficient “workarounds” that will allow people some measure of anonymity – “pseudonymity” will be available to people**
- **Confidentiality and autonomy will replace yearning for anonymity**
- **The rise of social media is as much a challenge to anonymity as business and government security reqs**
- **Reputation management and “information responsibility” will emerge**

The internet and the future of human relations



The Internet and the future of human relations

In 2020, when I look at the big picture and consider my personal friendships, marriage and other relationships, the Internet has mostly been a negative force on my social world.

12% experts

14% full sample

In 2020, when I look at the big picture and consider my personal friendships, marriage and other relationships, the Internet has mostly been a positive force on my social world.

85% experts

85% full sample

Themes

- **Personal “broadcasting” will continue because internet apps allow people to extend networks**
- **Some noted this does not foster deep relationships, and it can be detrimental. Internet use can be distracting at times, as much as it can be enriching**
- **Internet use makes people more of what they already are: If they are extroverted or open, they can be more so with tech tools. If they are introverted or siloed, tech tools can make them more isolated**
- **Technology is reconfiguring people’s sense of presence and is changing social patterns in work and personal life**



Lee Rainie

The impact of the internet on institutions



The impact of the internet on institutions

By 2020, innovative forms of online cooperation will result in significantly more efficient and responsive governments, business, non-profits, and other mainstream institutions.

71% experts

72% full sample

By 2020, governments, businesses, non-profits ... will primarily retain familiar 20th century models for conduct of relationships with citizens and consumers online and offline.

26% experts

26% full sample

Themes

- **The tide is too strong to resist – pressures for transparency are powerful**
- **The “future” is unevenly distributed – businesses will change most; governments least**
- **Data will be the platform for change**
- **Workarounds, facilitated by social media, will be common**
- **Efficiency and responsiveness aren’t the same thing**
- **Anonymous worries about corporate power**

The cloud vs. the desktop



The cloud vs. the desktop

By 2020, most people won't do their work with software running on a general-purpose PC. Instead, they will work in Internet-based applications... **Most innovative work will be done in that domain,** instead of in apps that run on a PC OS.

72% experts

71% full sample

By 2020, most people will still do their work with software running on a general-purpose PC.... **The most innovative and important applications will run on (and spring from) a PC operating system.** Aspiring application designers will write mostly for PCs.

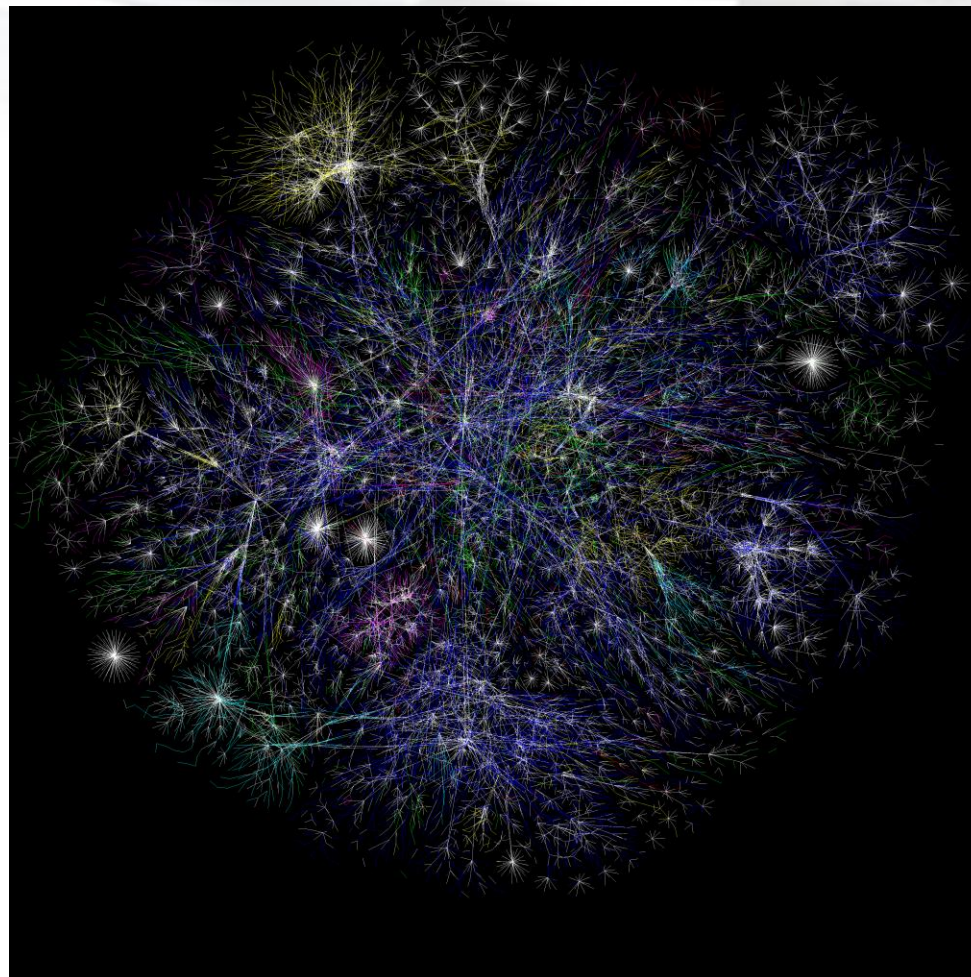
25% experts

27% full sample

Themes

- **The advantages of ubiquitous access and mobility trump other things**
- **Security problems will result – and new kinds of privacy disputes are inevitable**
- **Ordinary users won't know the difference – or care very much**
- **A hybrid world of cloud and desktop will evolve as each system finds its own primary value. Strains on spectrum might drive people back to device-based computing**

Will internet be dominated by end-to-end principle?



Will internet be dominated by end-to-end principle?

In the years between now and 2020, the Internet will mostly remain a technology based on the end-to-end principle that was envisioned by the Internet's founders. Most disagreements over the way information flows online will be resolved in favor of a minimum number of restrictions over the information available online and the methods by which people access it.

63% experts

61% full sample

In the years between now and 2020, the Internet will mostly become a technology where intermediary institutions that control the architecture and significant amounts of content will be successful in gaining the right to manage information and the method by which people access and share it.

29% experts

33% full sample

Themes

- **There is too much good history and user buy-in to part with end-to-end internet to see it largely overturned**
- **Openness has its own virtues and those who resist it will fall behind those who enable it**
- **Those who took the opposite view were not necessarily happy about it, but they argued there are many forces pushing towards more control of the internet: governments, businesses, users themselves to ward off bad experiences**
- **Some things will have to be managed, especially if the capacity of the current internet becomes strained**

The fate of the semantic web

avatar
semantic^{SL}
web
3:0
geospatial
MUVE

The fate of the semantic web

By 2020, the semantic web envisioned by Tim Berners-Lee will not be as fully effective as its creators hoped and average users will not have noticed much of a difference.

52% experts

47% full sample

By 2020, the semantic web envisioned by TBL and his allies will have been achieved to a significant degree and have clearly made a difference to the average internet users.

38% experts

41% full sample

Themes

- **There is too much variation among people and economic competitors to allow it to happen**
- **Improvements are inevitable, but they will not unfold the way TBL & Co. have sketched out; they will be grassroots-driven rather than standards-driven; data mining, links, analysis of social exchanges will help drive the process of smartening the web**
- **The semantic web will not really take off until it finds its killer app - the killer app will come when we can ask the internet questions and *Conversational search* could be the key**
- **There will be upstairs/downstairs deployment**

Will Millennials' use of tech change as they age?



Will Millennials' use of tech change as they age?

By 2020, members of Gen Y will continue to disclose personal information to stay connected. Even as they mature, have families, and take on more significant responsibilities, their enthusiasm for widespread information sharing will carry forward.

67% experts

69% full sample

By 2020, members of Gen Y will have grown out of much of their use of social networks and transparency-engendering online tools. As they age and find new commitments, their enthusiasm for widespread information-sharing will abate.

29% experts

28% full sample

Themes

- **Online sharing builds friendships, forms communities and builds reputations – Millennials have seen the benefits and will continue to share online as they grow older**
- **New social norms that reward disclosure of private information are already forming, in fact, 20th century notions of privacy are already morphing**
- **New boundaries will be set as people adjust to new realities shaped by social network providers**
- **Those who disagreed with the majority mostly said that commitments tied to aging will change Millennials level of sharing – especially the time crunch from work and family**

Thank you!

Lee Rainie

Director – Pew Internet Project

Lrainie@pewinternet.org

Twitter - @lrainie

202-419-4500

Janna Anderson

Director – Imagining the Internet Center

andersj@elon.edu

Twitter: @jannaq

336-278-5733