

VULNERABILITY SCENARIOS

Driver Forecasts #10: Web & Communication

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Background

Lack of access to information, social networks, and economic opportunities is a long-standing factor of vulnerability. Beginning in the 1990's, the explosion of the Internet gave many people much greater access to information. It also enabled new kinds of social networks, many of which are open to all. It also created new business opportunities, both for companies large and small and for individuals providing products and services in new ways. However, not all populations have benefited equally from the new technologies. A widening digital divide has left disadvantaged populations cut off from an increasingly technology-driven global economy. At the same time, the ability to delink work from a physical location has enabled many jobs previously held by low-skilled workers to be outsourced to other countries.

While a very high percentage of Americans use the Internet in their professional and personal lives, some populations still lag behind. As of late 2009, Internet penetration stood at 38% of those 65 or older, 60% for households with income less than \$30,000 per year, and only 39% of those with less than a high school education.¹ This divide is being reduced somewhat by the increasingly powerful functions of mobile phones, which have a very high penetration rate in low income populations and are used by some to access the Internet. Further convergence between mobile phones, the Internet, and televisions will likely bridge former gaps in information access.

In the coming decades, connectivity seen as advanced in 2010 will likely be ubiquitous, inexpensive, and accessible via a wide range of mobile or fixed devices, making immense amounts of content on any subject available in multiple formats almost everywhere. Networks of friends, colleagues, or people with shared interests will have more and more ways to connect, with numerous interface options.² An increasing share of information exchange will take place in virtual worlds focused on entertainment, socializing, education, and work. While probably not rivaling human intelligence, increasingly sophisticated artificial intelligence and expert systems will help users navigate the wealth of information that is at their fingertips.

While it is clear that technology will play a powerful role in shaping society and vulnerability, a number of uncertainties remain regarding how this technology will evolve. These include the cost of services and content, the content available, dominant information delivery formats (e.g., video, audio, image, text), and the level of ownership of networks and content. It is also unclear to what degree information

¹ "Internet User Profiles Reloaded," Pew Internet & American Life Project, January 5, 2010, <http://pewresearch.org/pubs/1454/demographic-profiles-internet-broadband-cell-phone-wireless-users>.

² Steven Levy, "Tabula Rasa, *Wired*, April 2010, 78.

technology will be tied to work of all kinds, and to what extent technology will change American culture itself. The answers to all these questions will have profound effects for vulnerability over the next two decades.

Forecasts

The Alpha forecasts represent expectable or “most likely” futures, the Beta forecasts envision challenging possibilities (e.g., what could go wrong), and the Delta forecasts represent visionary or surprisingly successful futures that would have a positive impact on reducing vulnerability.

Alpha Forecast – Web and Communication 2030

By 2030, access to networks is readily available, but disadvantaged populations lag behind the leading edge and are not equipped to take advantage of the full economic and social opportunities that information networks provide. This contributes to lower educational performance, fewer job opportunities, and lower income levels. Specific forecasts for this future include:

- High-bandwidth information flows are available ubiquitously via a variety of platforms and channels.
- Levels of bandwidth well beyond those of 2010 are readily affordable for most Americans, even those in low-income groups.
- Input and output interfaces are extremely diverse, allowing effective information technology use at all levels of skills, education, and literacy. Language translation software is increasingly helpful as well.
- Large amounts of information are conveyed in images, videos, animation, and sound. This increases access for many people but also degrades certain kinds of information skills, especially for lower-education groups.³
- Advice—expert and not—is widely available over the Web. It remains difficult for many people, especially those in low-education groups, to find clearly useful, unbiased advice and information.
- Those with the education, inclination, and intelligence to use available information have far more options than in the past, and some people are able to overcome disadvantages that would have excluded them from success in the past.⁴ Still, many members of vulnerable groups lack one or more of these factors, and cannot take full advantage of available opportunities.
- Many highly paid jobs require sophisticated interactions with information systems and networks. Those with less education remain at a distinct disadvantage in the job market.

³ Susan Jacoby, “Call Me a Snob, but Really, We’re a Nation of Dunces,” *Washington Post*, February 17, 2008, B5.

⁴ Janna Quitney Anderson and Lee Rainie, “Does Google Make Us Stupid?” Pew Internet & American Life Project, February 19, 2010, <http://pewresearch.org/pubs/1499/google-does-it-make-us-stupid-experts-stakeholders-mostly-say-no>.

- Social media reinforce existing social networks, and generate new social ties based on interests, demography, locale, or other factors. Effects on vulnerable populations are mixed, but the overall direction is to reinforce existing patterns of inclusion and exclusion.

Beta Forecast – Web and Communication 2030

By 2030, access to key information and technology tools is restricted based largely on price, disadvantaging some vulnerable populations. Ownership structures for the blended Internet, cable and telephony infrastructures reduce innovation and bottom-up creativity, closing down avenues for technology-based entrepreneurship from website creation to selling physical goods online. Specific forecasts for this future include:

- Basic Internet and cable connectivity is low-cost (and high-bandwidth by 2010 standards), but access to key networks and content is comparatively expensive.
- Internet “brownouts” occur on a regular basis, reducing dependability for all but those on the priciest service plans.
- Access to other key aspects of the networked world is made exclusive based on social factors and connections, the virtual equivalent of the country club or gated community. This exclusivity shuts out many vulnerable groups.
- Tighter corporate control of information access and flows—including the discarding of net neutrality—keeps prices higher, reduces innovation, and undercuts the production of user-generated content.⁵ Fewer channels for economic empowerment and entrepreneurship are available to those without more costly internet and information resources.
- Lack of information skills on the part of some vulnerable populations reduces their ability to effectively use the information that they can access. Many people have difficulty discerning true and helpful information from information that is inept, false, or exploitative.
- Powerful information tools (such as some for data mining) and expert systems that provide advice on matters such as finances are relatively expensive, limiting their use by the less-well-off. Middle- and high-income groups have access to channels and systems that optimize buying and financial decisions, increasing their relative economic advantages over the poor.
- Perpetual connection to social networks reinforces existing ways of thinking and habits of mind for many users, both affluent and poor.⁶ Cultures of poverty are perpetuated as people in disadvantaged groups have abundant, continuous ties to people in similar situations.
- Ubiquitous social media and compartmentalized information reinforce high levels of political fragmentation and hostility, reducing social cohesion and the ability to form political consensus. This undercuts government effectiveness and blocks effective solutions to social problems.
- Poorer and less technologically adept populations are preyed upon disproportionately by hackers and identity thieves, increasing the cost of online life for these groups.

⁵ Tim Wu, “Bandwidth Is the New Black Gold,” *Time*, March 22, 2010, 46.

⁶ Jonah Lehrer, “The Buddy System,” *Wired*, October 2009, 127-131, http://www.wired.com/medtech/health/magazine/17-10/ff_christakis?currentPage=all.

- Ubiquitous information creates personal transparency. Those with criminal records, past financial trouble such as bankruptcy, or a lack of education are more easily harmed by this transparency. Lack of privacy also bolsters discrimination in online spaces and social networks: the vulnerable are often shunned for both real-world and virtual behavior.
- Research reveals small but measurable health effects from mobile phones; they are concentrated in low-income groups who can't afford the latest and safest handsets.

Delta Forecast – Web & Communication 2030

By 2030, the relatively low cost of technology, high quality of content, and ease of use greatly increase the utility of information networks in reducing vulnerability. Connectivity provides access to new social networks and new employment options. Specific forecasts for this future include:

- Vast amounts of high-quality information, and the means to access it, are free or extremely inexpensive, and 90% of adults have one or several devices to continuously access the Web. Many more people are able to find and use information on needs such as government assistance, education, crime prevention, and health.
- New kinds of interfaces allow people easy, effective access to information when and where it is needed, and provide ways for them to express and spread their ideas.⁷ Personalized tools, including “health advocate avatars,” help organize and prioritize information.⁸ Information devices actively compensate for lack of information skills and other deficits among some vulnerable groups.
- Social networking tools and approaches are widely used to enhance public involvement in decision making and priority-setting, creating more responsive governments.⁹ This includes “serious games” that use interactive and immersive methods. Political participation rates among low-income populations increase.
- Advanced mobile phones and life-logging cameras equipped with high-definition video are effectively miniature broadcast channels and revolutionize citizen journalism and activism. Vivid, real-time imagery is available of bad sanitary conditions, police abuses, crime, and other issues that plague vulnerable communities, increasing their visibility and immediacy and spurring counteraction. These inputs are compiled to monitor community health and to identify problems while they can still be mitigated.
- Mobile devices are full-scale information portals, and provide their users with as-needed information and assistance, based on awareness of prior behavior, normal schedule, and current location. Mobile devices know where they are and what that likely means for their owners.

⁷ Steven Levy, “Tabula Rasa, *Wired*, April 2010, 78; Kevin Kelly, “Window on the World, *Wired*, April 2010, 77.

⁸ Jamais Cascio, “Get Smarter,” *The Atlantic*, July-August 2009.

⁹ Janna Anderson and Lee Rainie, “The Impact of the Internet on Institutions in the Future,” Pew Internet & American Life Project, March 2010, 3.

- Intensive, two-way information flows offer new levels of effective assistance from governments to various vulnerable populations.¹⁰ For instance, voluntary tracking and monitoring is used to provide transportation services and enhanced, continual medical care.
- Ubiquitous networks give access to information and virtual assistance (human and expert systems) that help level the playing fields for disadvantaged populations, in areas from education to day-to-day life skills.¹¹
- Virtual assistance includes abundant remote mentoring systems, which build on early efforts such as Icouldbe.org and iMentor.¹² These are available in a variety of languages and designed with the cultures of a wide range of low-income populations in mind. Technology-enabled social networks break down some of the barriers that separate vulnerable groups from the rest of society.
- Flexible, open, infotech-enabled options for work and marketing of products and ideas offer more routes out of poverty and toward success. People can do everything from monitoring security cameras to producing handicrafts to order, with tasks at all possible levels of skill and available time. Social media supports local entrepreneurship and home businesses.
- Effective translation software—online and in mobile devices—assists those who don't speak English or are not comfortable using English in communicating and accessing information, which is especially helpful for immigrants early in their time in the United States.¹³

¹⁰ Gary Wolf, "Know Thyself," *Wired*, July 2009, 94-95.

¹¹ "Can't Loose [sic] Weight? Get a Robot Coach," Realitypod.com, May 1, 2010, <http://realitypod.com/2010/05/robot-diet-coach/>.

¹² Gary A. Berg, "Online Mentoring Programs," *eLearn Magazine*, September 22, 2009, <http://www.elearnmag.org/subpage.cfm?section=articles&article=95-1>.

¹³ Miguel Helft, "Google's Computing Power Refines Translation Tool," *New York Times*, March 8, 2010, <http://www.nytimes.com/2010/03/09/technology/09translate.html?th&emc=th>.