

# mind•full: a brainsnack for future leaders with ethical appetites

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## access and the internet

Access to the Internet will bring the world to you. It is a ticket to the Louvre, a channel to cutting edge research, a guide to being a better informed citizen, and a bridge to people in far away places.

But will everyone enjoy these benefits? Access to the Internet requires expensive computers and an advanced communications network, which includes phone lines and fiber optic cables. Many countries lack even the basic infrastructure needed to be on the information superhighway. The primary routes to the Internet are through commercial service providers or universities. Commercial service providers, like America Online or CompuServe, charge a combination of monthly fees and hourly rates, a cost often prohibitive for those with moderate or low incomes. At universities, access usually extends only to faculty, staff, and students and not to local communities. In addition, taking advantage of the Internet requires computer literacy—a skill rarely taught in impoverished and disadvantaged communities. These computer skills need constant upgrading, much like the computer hardware upon which all of this is based.

To get on the information superhighway you need a car (a computer), you need roads to the highway (service providers), and you need to know how to drive. Of course, you also need a highway (a telecommunications infrastructure). If any of these are missing, you cannot access the Internet. As the Internet becomes increasingly important, societies which lack the technology, service, and know-how risk even greater exclusion in the Information Age.

The mission of Student Pugwash USA is to promote the socially responsible application of science and technology in the 21st century. As a student organization, Student Pugwash USA encourages young people to examine the ethical, social, and global implications of science and technology, and to make these concerns a guiding focus of their academic and professional endeavors.

The **mind•full** series encourages readers to explore crucial ethical dilemmas associated with the application of science and technology.

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# go figure!

Internet use is increasing dramatically. In general, the people who have access to the Internet are from advantaged backgrounds. These are the people with enough discretionary income, education, and time needed to use the Internet on a regular basis.

Consistent statistics about the extent and demographics of Internet use are hard to come by. Typical surveys count only the number of Internet hosts. Since many people can access the Internet through a single host, these statistics provide an incomplete picture of who is actually using the Internet. Currently, the best estimates of how many people are on-line range from 16 to 22 million (*New York Times*, April 17, 1996). The number of computers and modems owned in a region is another common yardstick used to estimate Internet use.

## computer availability in selected countries

| country        | computers<br>(per 1,000 people) |
|----------------|---------------------------------|
| United States  | 287                             |
| Australia      | 192                             |
| Canada         | 188                             |
| United Kingdom | 162                             |
| France         | 129                             |
| Japan          | 97                              |
| Spain          | 79                              |
| Taiwan         | 74                              |
| Hungary        | 27                              |
| Mexico         | 17                              |
| South Africa   | 10                              |
| Russia         | 8                               |
| Brazil         | 6                               |
| Indonesia      | 2                               |
| China          | 1                               |
| India          | 1                               |

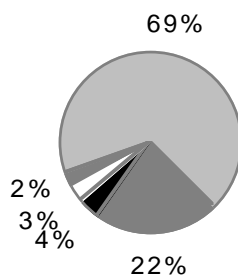
**Source:** E. Juliussen and K. Petska-Juliussen, *Computer Industry Almanac 1994-1995*. Quoted in L. Brown, et. al., *Vital Signs* (New York: W.W. Norton & Company, 1995).

## who's on-line?

| region  | number of hosts |
|---|-----------------|
| North America                                       | 4,541,470       |
| Western Europe                                      | 1,463,870       |
| Pacific   | 251,320         |
| Asia  | 229,854         |
| Middle East/South America/<br>Africa/Eastern Europe | 155,031         |

**Source:** Internet Society, Press Release, August 2, 1995. Based on figures from Network Wizards.

## number of hosts



## degrees of access

Using the Internet means being able to send and receive information electronically. But the information transmitted can range from a text message to a NASA picture of the moon to the sound of Socks the Cat on the White House World Wide Web page. Most computers with modems can handle basic text, but accessing more complex information requires newer, faster systems. Students in a disadvantaged community technically may have Internet access in that they can send and receive text. However, they might not be able to get on the World Wide Web or use other advanced technologies without expensive upgrades in equipment.

# in control or out of it ?

Around the world, policy makers are coming to believe the Internet will spur economic growth and serve as an educational tool. There seems to be agreement among international leaders on the importance of developing the telecommunications infrastructure needed to provide universal Internet access. The National Information Infrastructure (NII) in the US and its counterpart, the Global Information Infrastructure (GII), have received support from just about every sector of society. While not yet a coordinated effort, aspects of the GII are being addressed by a variety of individual nations, alliances, and non-governmental organizations. In the US, the Clinton administration's vision of universal Internet access was released in a 1993 report, "The National Information Infrastructure: Agenda for Action," issued through the National Telecommunications and Information Administration. On a larger scale, several alliances, such as the Organization of American States, have addressed the need to improve and expand telecommunications technologies. Organizations like the World Bank and United Nations Development Program have also started to use the Internet to promote development.

Some analysts have expressed concerns about the GII. Some are worried that service providers more interested in their own profit than in people will lead the development of the GII. The result may be merely "infotainment," leaving the vast potential of the Internet untapped. Skeptics argue that the frenzy surrounding the Internet might result in a lack of consideration for the social impacts of the GII. Finally, critics say the decision makers may be neglecting the long term costs of the Internet in their plans. Once a network is "wired," there are expensive maintenance and administrative costs to keep the network up to date and running smoothly. The hardware and wiring for networks is constantly advancing as well, thus requiring costly upgrades on a regular basis to avoid obsolescence.

## geek speak

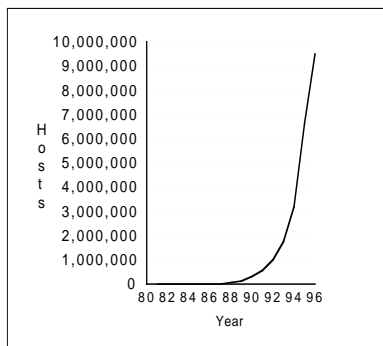
**internet**—a loose amalgam of thousands of computer networks reaching millions of people all over the world.

**e-mail**—the most commonly available and most frequently used service on the Internet. E-mail lets you write and send a text message to another person.

**world wide web**—a browsing and searching system that . . . links related documents using a very powerful concept called hypertext . . . . [A]lmost every piece information you look at provides pointers, or links, which you can follow to other documents.

**Source:** Tracey LaQuey with Jeanne Ryer, *The Internet Companion: A Beginner's Guide to Global Networking* (New York: Addison-Wesley Publishing Co., 1993).

## number of internet hosts



**Source:** "Host Count History," Internet Domain Survey, Network Wizards, January 1996. Available on the Web at <http://www.nw.com>.

| date  | hosts     |
|-------|-----------|
| 8/81  | 213       |
| 5/82  | 235       |
| 8/83  | 562       |
| 10/84 | 1,024     |
| 10/85 | 1,961     |
| 11/86 | 5,089     |
| 12/87 | 28,174    |
| 10/88 | 56,000    |
| 7/89  | 130,000   |
| 10/90 | 313,000   |
| 7/91  | 535,000   |
| 7/92  | 992,000   |
| 7/93  | 1,776,000 |
| 7/94  | 3,212,000 |
| 7/95  | 6,642,000 |
| 1/96  | 9,472,000 |

Neo-Luddites believe that the Internet is harmful to society (the original Luddites were people who rebelled against the Industrial Revolution, with particular emphasis on the textile industry). Neo-Luddites are not the only critics who think proponents have exaggerated the Internet's potential. Many prominent experts believe that access to and use of the Internet has a down side. Some say the Internet is dehumanizing and essentially anonymous.

Critics point to other technological revolutions as they raise these concerns. For example, the television was promoted with similar intensity in mid-century as a revolutionary tool allowing greater information access. Many now question whether its impact has been all

positive. Most people do have access to information via their television, but they also spend countless hours engrossed in

“entertainment.”

Internet skeptics argue that universal access to the Internet will simply displace television-watching “couch potatoes” with info-surfing “Net potatoes.”

In another example, the interstate superhighway was a transportation revolution in the 1950s. Few would disagree that the superhighways were of immense benefit to the US. But they also facilitated urban sprawl, razed once viable communities, and increased consumption of oil. Likewise, the Internet's positive impact may be offset by unforeseen negative consequences.

## neo-luddite insight

### gi's granny

The Internet did not just explode into existence in the last few years. The Internet started off as a US Department of Defense project designed to allow the US military to communicate in a nuclear war. The premise was that it was a bad idea to have communications routed through one place, since that place could be destroyed. In 1969, the Defense Advanced Research Projects Agency (DARPA) developed a computer network which would ensure that an electronic message would reach the intended destination (unless the destination had been vaporized) even if major portions of existing communications structures had been destroyed. The network, called ARPANET, was a web of interconnected computers that gave a message several routes to its destination. The network also facilitated communication between defense researchers and the military. It eventually split into ARPANET and Milnet, but the two networks were still able to communicate with each other. While this may not seem like a big deal now, having separate networks linked was revolutionary at the time.

The 70s and disco wore on, and non-defense researchers began using similar networking developments. Independent networks began to spring up. The National Science Foundation formed a network (NSFNET, of course) which linked researchers to several national supercomputing centers. Technology, in the form of both networks and communications protocols, was developed which allowed all of these networks to connect to and communicate with each other, thus forming the Internet.

The obituary: In 1991, ARPANET was dismantled. Worldwide, researchers were using faster networks. But anyone who was around in “the good ol’ days” will tell you that ARPANET started it all.

# (anything but a) conclusion

The Internet is a tool that can, and likely will, change the world. How soon and how equitably this happens remains to be seen. The following questions deal with some of the most pressing aspects related to access and the Internet. Often, as the debate over the GII continues, the fundamental issue of access and the Internet is overlooked. The first question to ask is, "Is the information superhighway important?" Then ask, "Why?" Your answers will affect the way you look at the dilemmas highlighted below.

How do **you** answer the **tough questions**

.....

The opportunity to communicate ideas and opinions is an important freedom. Do you think access to the Internet will enhance the ability of people to share their beliefs in a global setting? What are the potential drawbacks of this, particularly in repressive or non-democratic countries?

Will non-industrialized and "informationally impoverished" countries be able to compete in the 21st century if the current access discrepancy continues? Or will they fall into a cycle of increasing disadvantage? Do developed countries have an obligation to help developing countries get access?



With limited resources, developing countries must decide how to balance various demands for services. How should developing countries weigh access to the Internet with other national priorities, such as health care, education, infrastructure development, job creation, etc.? If Internet access is to be expanded in these countries, should institutions such as hospitals and universities be given a higher priority than communities or individuals? Why?



Currently, there are an elite few exchanging information on the Internet, while others are excluded from the dialogue. Whose responsibility is it to address this issue—policy makers, service providers, Internet users, the computer industry, or the public? What should they do to address this disparity?

.....  
 • Many argue that the ease of Internet communication is a threat to national security. Militants and insurgents can communicate and thrive with virtual anonymity. The recipe for making a bomb is available via the Internet. Do governments have a right and/or a responsibility to regulate access and control what information is made available? If they are providing the communications infrastructure, do they have a right to monitor the information or the people using the Net? Is such regulation censorship or a violation of human rights?  
 .....

Countries and cultures have different social traditions and beliefs. How can we integrate access to the Internet and societal values without being culturally insensitive? Is it acceptable to have widely available items censored in one country or withheld from a certain population?

The Internet traditionally has been male dominated. Should efforts be made to get girls and women on-line? What changes in Internet culture would have to occur to make this happen?



A variety of sites on the Internet offer a wealth of information about politicians and policy, ranging from who funds which campaigns to alerts on upcoming votes. Does the Internet increase democratic action, as some argue? Is it only a privileged few who enjoy this benefit? How does this affect the democratic process?

Some would say the Internet provides an opportunity for often voiceless and oppressed people to broadcast their messages to the world. Are these messages getting out or are they getting lost in the flood of information crossing the Internet? If you came across a plea from a victim of oppression, would you have a responsibility to spread the word?

■ What should be the primary mission of the Internet—providing access to increasing amounts of information or connecting people and building virtual communities?  
 ■

Should access to the Internet and future information structures be considered a new human right? Is access to information a basic necessity of life? Will it be in the 21st century?



**in brief**

- "Where is the Digital Highway Really Heading: The Case for a Jeffersonian Information Highway," Mitch Kapor, *Wired*, July/August 1993.
- "The Information Highway—Who Will Control It?" *The Nation*, July 12, 1993.
- "Democracy on the Electronic Frontier," Susan Ginsburg Hadden, in Gary Chapman (ed), *Beyond the Endless Frontier*, The MIT Press, 1996.
- "A Legislative Agenda for Telecommunications," Edward J. Markey, *Issues in Science and Technology*, Fall 1993.
- "Direct and Unrestricted Access to the Internet: A Case Study of an East Central Florida High School," Michael Gallo and Phillip Horton, *Educational Technology Research and Development Journal*, Vol. 42, No. 4, 1994.
- "Networking in Africa: An Unavoidable Evolution Towards the Internet," Jean-Yves Djamen, *Technical Report 937*, Departement d'Informatique et de Recherche Operationnelle (IRO), Universite de Montreal, January 1995. An academic, but insightful paper about the dawning of the Internet in developing countries. On the Web at [http://www.sas.upenn.edu/african-studies/padis/telmatix\\_Djamen.html](http://www.sas.upenn.edu/african-studies/padis/telmatix_Djamen.html).
- "Advanced Telecommunication in US Public Elementary and Secondary Schools," National Center for Education Statistics, E.D. TABS, February 1996, US Department of Education, Office of Educational Research and Improvement, NCES 96-854.

**dig deep**

- *Silicon Snake Oil: Second Thoughts On The Information Highway*, Cliff Stoll—a good read that explains why, in the author's opinion, the Internet is more hype than hip. New York: Anchor Books, 1995.
- *Being Digital*, Nicholas Negroponte—a popular columnist for *Wired* magazine addresses life in the information age. A solid resource for the computer savvy, but technophobes should beware. New York: Alfred A. Knopf Press, 1995.
- *Technopoly: The Surrender of Culture to Technology*, Neil Postman—another good cautionary tale about the dangers of the Information Age. New York: Alfred K. Knopf Press, 1992.
- *Zen and the Art of the Internet: A Beginner's Guide*, Brendan P. Kehoe—explains the Internet in peaceful terms. Englewood Cliffs, NJ: PTR, Prentice Hall, 1994.
- *Wired* magazine. A monthly publication about anything and everything "cyber." Definitely on the cutting edge—good for keeping up with the issues and keeping up with the Cyber Joneses. On the Web at <http://www.hotwired.com/>.

**top picks**

- Computer Professionals for Social Responsibility—an organization focused on computer issues, particularly those related to issues of access and equity on the Internet. This site contains lots of great articles and information, as well as links to other resources.

These include:

"Scenarios of People Using the NII" and "The Information Highway from Hell: A Worst-Case Scenario," Jeff Johnson—read both to get a truly balanced perspective on the thrill and the danger of the emerging Information Age. Also—"Serving the Community: A Public-Interest Vision of the National Information Infrastructure," Computer Professionals for Social Responsibility, Executive Summary, 1994—a great resource for learning more about the pros and cons of the NII. Available on the CPSR web site <http://www.cpsr.org/dox/home.html>

- Limitless: Measuring the Net—Contains pointers to sites containing stats about the Internet, including the estimated size of the Net and info about users. <http://www.limitless.co.uk/net/>

**[http://your\\_mind!](http://your_mind!)**

This **mind•full** was written by Russell M. Villa-Singleton, International Programs Coordinator of Student Pugwash USA.

# non-electronic information transfer

## webspaces

**best of the rest**

- The Internet Society (an NGO for global cooperation and coordination on the Internet; tons of good resources)—<http://www.isoc.org/>
- The List by Country (allows you to find the Internet providers for every country across the globe; a good tool for learning about access issues)—<http://www.thelist.com/country/country.html>
- Newslines (an electronic newsletter about Internet development and resources in Africa)—<http://www.iafrica.com/iafrica/newsletter/info.html>
- Plugged In (a community access organization that provides training and support locally and, through the Internet, on a national basis)—[http://www.plugged\\_in.org/](http://www.plugged_in.org/)
- MetaSystems Design Group (The Metasystems Design Group is "dedicated to using information technology to enhance organizations to empower people and in the process, to contribute to 'closing the gap' between the human condition and human potential")—<http://www.tmn.com/>
- World Bank Electronic Media Center (established to help the World Bank reach large audiences at a lower cost than through traditional media and includes lots of info about bringing the Internet to developing countries)—<http://www.worldbank.org/html/emc/welcome.html>
- Matrix Information and Directory Services (includes demographics on who is using the Internet)—<http://www.mids.org/>

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## but wait, there's more!

- **mind•full: a brainsnack for future leaders with ethical appetites.** International weapons trade and emerging infectious disease issues available upon request. Upcoming issues in summer 1996 will address: the future of nuclear weapons, water quality and availability, alternative energy sources, and public participation in scientific decision making.
- **Jobs You Can Live With: Working at the Crossroads of Science, Technology, and Society.** The fifth edition of the Student Pugwash USA internship directory. It highlights approximately 300 organizations that work to promote the ethical use of science and technology and provides suggestions on how to go about the internship and job search (available spring 1996).
- **The Global Issues Guidebook.** A 600 page student-authored discussion and classroom resource on science, technology, and society issues.
- **Pugwatch.** The chapter newsletter.
- **Chapter Organizing Guide.** Provides chapter members with an A to Z guide to getting a campus-based chapter up and running.
- **Tough Questions.** Student Pugwash USA's newsletter.

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