

COMPUTER  STUDIES

# COMPUTERS IN SOCIETY

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Members of the Advisory Board are instrumental in the final selection of articles for each edition of ANNUAL EDITIONS. Their review of articles for content, level, currentness, and appropriateness provides critical direction to the editor and staff. We think that you will find their careful consideration well reflected in this volume.

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Kathryn Schellenberg

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# To the Reader

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In publishing ANNUAL EDITIONS we recognize the enormous role played by the magazines, newspapers, and journals of the *public press* in providing current, first-rate educational information in a broad spectrum of interest areas. Many of these articles are appropriate for students, researchers, and professionals seeking accurate, current material to help bridge the gap between principles and theories and the real world. These articles, however, become more useful for study when those of lasting value are carefully *collected, organized, indexed, and reproduced* in a *low-cost format*, which provides easy and permanent access when the material is needed. That is the role played by ANNUAL EDITIONS. Under the direction of each volume's *academic editor*, who is an expert in the subject area, and with the guidance of an *Advisory Board*, each year we seek to provide in each ANNUAL EDITION a current, well-balanced, carefully selected collection of the best of the public press for your study and enjoyment. We think that you will find this volume useful, and we hope that you will take a moment to let us know what you think.

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**W**e can only guess at how the ever-increasing power, diversity, and pervasiveness of computers—especially *networked* computers—might affect the patterns of our individual and social lives. However, it is hoped that *Computer Studies: Computers in Society* will complement your technical understanding of these emerging technologies by acquainting you with some of the philosophical, economic, political, and social dimensions of the information society.

Contributors to the seventh edition of *Computer Studies: Computers in Society* represent a diverse range of backgrounds, and their collective writings highlight a wide spectrum of issues and views about how the information age will or ought to unfold. For the most part, their writing styles are very understandable and devoid of the kind of unintelligible technical jargon that can be a barrier to becoming informed about technological issues.

Because of its social focus, *Computer Studies: Computers in Society* is organized to reflect the major dimensions of society rather than various aspects of computing. The major themes of the book are the economy, community, politics, and conflict. Many of these themes are also examined in an international context. The final section looks at some of the philosophical challenges posed by emerging technologies.

Each article has been selected for its informational value, but “informative” does not necessarily imply correctness or validity. In fact, some of you may find that you strongly disagree with, or are even offended by, a position expressed in one or more articles—I may well agree with you. On the other hand, some may feel simply inspired by arguments that make others irate. *Computer Studies: Computers in Society* is meant to generate rather than answer questions on how computers will affect society. Hopefully, such queries will serve to clarify issues, broaden perspectives, provoke curiosity, and stimulate informed discussion of and participation in the computer age.

Readers can have input into the next edition of *Computer Studies: Computers in Society* by completing and returning the postage-paid article rating form in the back of the book.



Kathryn Schellenberg  
Editor





## Introduction

Two articles offer various visions of the present and future computer-networked society.

## UNIT 1



## The Economy

Five articles examine the impacts of computer technologies on global manufacturing, the business cycle, productivity, and commerce.

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Topic Guide	2
Selected World Wide Web Sites	4

### Overview

- |   |    |
|---|----|
| 1. Welcome to Cyberspace: What Is It? Where Is It? And How Do We Get There? Philip Elmer-DeWitt, <i>Time</i> , Special Issue, Spring 1995.  | 6  |
| Philip Elmer-DeWitt contrasts novelist William Gibson's science-fictional cyberspace with current reality. Focusing on the <i>Internet</i> , he observes that the near-term impact of cyberspace is being oversold. The long-term impact, however, "is likely to be more profound and widespread and unanticipated than anyone imagined—even the guys who write science fiction." | 8  |
| 2. The Internet & Sexual Personae, Camille Paglia, and The Internet Produces a Global Village of Village Idiots, Richard John Neuhaus, <i>Forbes ASAP</i> , December 2, 1996.   | 13 |
| In this pair of articles, an ultra-libertarian and a Roman Catholic priest offer very different analyses on the implications of the computer <i>revolution</i> .  |    |

### Overview

- |  |    |
|--|----|
| 3. Clicking onto Webzines, Herb Brody, <i>Technology Review</i> , May/June 1997.   | 16 |
| "Information" is one of the leading products of the computer age. Online <i>webzines</i> are an emerging source of information. In this article, Herb Brody describes this new medium. | 18 |
| 4. The New Business Cycle, Michael J. Mandel, <i>Business Week</i> , March 31, 1997.   | 27 |
| Michael Mandel discusses the dramatic growth of the <i>high-tech</i> sector and its impact on the wider U.S. economy.  |    |

## UNIT 2



### Work and the Workplace

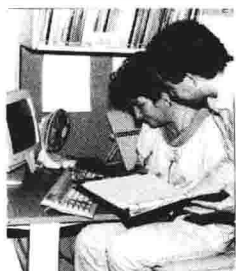
Four articles look at the latest in office automation, electronic networks in the workplace, telecommunity, computer-related injuries, and information overload.

5. **What Has the Computer Done for Us Lately?** Louis Uchitelle, *New York Times*, December 8, 1996. 33  
Despite widespread adoption of computing technology, the U.S. economy has not experienced strong growth. Louis Uchitelle offers possible reasons why expected *productivity* gains have not materialized.
6. **Creating the People's Computer**, Michael L. Dertouzos, *Technology Review*, April 1997. 36  
A leading computer scientist takes up the issue of poor performance in *productivity*. In part, Michael Dertouzos blames the "unfriendliness" of current computing systems and offers suggestions on how to make "machines serve human needs."
7. **Money in Electronic Commerce: Digital Cash, Electronic Fund Transfer, and Ecash**, Patiwat Panurach, *Communications of the ACM*, June 1996. 44  
*Ecash*, *digital cash*, and *electronic fund transfer* offer three means of electronic exchange. Patiwat Panurach explains similarities and differences among these payment systems and discusses their monetary implications.

### Overview 50

8. **The Ripple Effect of Computer Networking**, Bob Filipczak, *Training*, March 1994. 52  
Working with network computers changes the way employees *communicate*. According to Bob Filipczak, networking can also lead to increased employee loyalty and *democratic participation* in organizational affairs. It may even affect the way employees think.
9. **Virtually Working: Dispatches from the Home Front**, Marc Hequet, *Training*, August 1996. 57  
It is projected that 60 million Americans will do some kind of work at home by the year 2000. Marc Hequet relates that "*telecommuting* can be great," but this virtual work also has presented drawbacks for workers and managers.

## UNIT 3



### Computers and Social Participation

Four articles discuss aspects of social involvement and interaction in a computer-mediated society.

10. **Working Out the Kinks**, Catherine Romano, *Management Review*, February 1996. 63

People who work with computers risk developing *repetitive strain injuries*. Here, Catherine Romano explains how companies can reduce injuries and compensation claims.

11. **Overload**, Jay Stuller, *Across the Board*, April 1996. 66

Many workers are overwhelmed by e-mail, voice mail and fax messages. Jay Stuller reports on the problem of *information overload*.

#### Overview 72

12. **Finding One's Own Space in Cyberspace**, Amy Bruckman, *Technology Review*, January 1996. 74

The Internet presents a rich assortment of *online "communities."* Amy Bruckman gives counsel on how to find or initiate communities where "birds of a feather" can associate.

13. **Session with the Cybershrink: An Interview with Sherry Turkle**, *Technology Review*, February/March 1996. 80

Sherry Turkle, a prominent social scientist, responds to an interview that explores both positive and negative impacts of computing on *social interaction*, personality, and the "self."

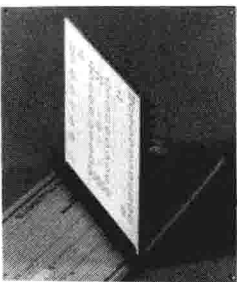
14. **The Computer Delusion**, Todd Oppenheimer, *The Atlantic Monthly*, July 1997. 87

The education system plays an important role in preparing children to participate in society. Many parents, educators, computer industry experts, and government leaders believe that computers can greatly enhance the educational process. Todd Oppenheimer discusses claims and evidence about the value of computers in the classroom in this essay.

15. **A Campus of Our Own**, Susan Saltrick, *Change*, March/April 1996. 99

Susan Saltrick reflects on the social dimensions of a traditional university education and questions the notion of whether genuine *communities* are possible in cyberspace.

# UNIT 4



## Social Values: Ethics, Law, and Privacy

Five articles examine issues related to intellectual property, legally and ethically questionable use of computer networks, computer crime, the use and potential abuse of computer simulations in legal proceedings, and threats of privacy.

Overview	104
16. Law and Order Comes to Cyberspace, Edwin Diamond and Stephen Bates, <i>Technology Review</i> , October 1995. The authors discuss "difficult issues" related to guarantees of free speech, legal jurisdictions, accountability, safeguarding children, and the protection of intellectual property.	106
17. Who's Reading Your E-Mail? Richard Behar, <i>Fortune</i> , February 3, 1997. This article discusses the serious problem of <i>hackers</i> who break into networked computers to "make mischief, steal trade secrets—even sabotage careers." A sidebar debunks the "myth of e-mail privacy."	113
18. Simulations on Trial, Arielle Emmett, <i>Technology Review</i> , May/June 1994. "Computer-generated animations are helping judges and juries visualize the final moments of an air crash, the ballistics of an unsolved murder, even botched medical care." Arielle Emmett discusses their benefits and their liabilities, such as the potential for distortion.	120
19. The Invasion of Privacy, Reed Karaim, <i>Civilization</i> , October/November 1996. The computer files of government agencies and large corporations contain intimate details of our lives. The growth of electronic databases and other threats to <i>privacy</i> are discussed in this article.	126
20. High Resolution, Unresolved, Mary Graham, <i>The Atlantic Monthly</i> , July 1996. Powerful new satellites offer the ability to snoop from space. Mary Graham discusses whether this should be cause for new worries about <i>privacy</i> .	132



## UNIT 5



### Politics and the State

Four articles explore the implications of computing and networking for disseminating political information, the electoral process, democratic choice, local tax revenues, totalitarianism, and electronic warfare.

## UNIT 6



### Technological Risks

Four articles discuss technological obsolescence, the threats posed by computer malfunction, and legal implications of flawed electronic information.

#### Overview 136

21. **Digital Politics**, Hal Berghel, *Communications of the ACM*, October 1996. 138

Throughout the computerized world, *political parties and politicians* are establishing themselves on the Web. Here, Hal Berghel describes this trend and discusses its implications.

22. **The Great Internet Tax Drain**, Nathan Newman, *Technology Review*, May/June 1996. 143

The growth of online retail activity threatens the *tax revenue base* of local governments. Nathan Newman argues that effects on local economies could be catastrophic and offers suggestions on how to alleviate future problems.

23. **Is Big Brother Hanging by His Bootstraps?** L. T. Greenberg and S. E. Goodman, *Communications of the ACM*, July 1996. 147

The authors examine complex issues related to the information revolution and the potential for totalitarian *government control*. They observe that "some institutions will prosper, others will vanish, but few will be unaffected."

24. **Warfare in the Information Age**, Bruce D. Berkowitz, *Issues in Science and Technology*, Fall 1995. 152

This article focuses on the use of computer systems for *military advantage*. As the author explains, the prospect of *information warfare* poses many basic questions that have yet to be resolved, but it may offer the United States an opportunity as well as a threat.

#### Overview 160

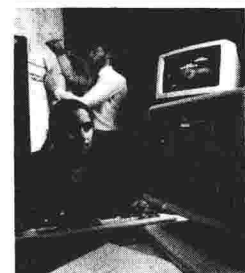
25. **It's 10 O'Clock: Do You Know Where Your Data Are?** Terry Cook, *Technology Review*, January 1995. 162

Computers make it possible to store and lose vast amounts of critical information. In this report, Terry Cook outlines the problems in *preserving* both the *content and context* of *electronic documents*.

26. **Software's Chronic Crisis**, W. Wayt Gibbs, *Scientific American*, September 1994. 166

According to W. Wayt Gibbs, it is virtually impossible to write error-free complex software. Gibbs offers several examples of *large-scale software* projects gone awry, explains why software reliability is so difficult to design, and describes efforts to improve the standard of software production.

# UNIT 7



## International Perspective and Issues

Five articles examine issues related to the computer industry in Ireland, networking in China, software piracy in Singapore, the gap between rich and poor nations, and Third World development.

27. **Fatal Dose**, Barbara Wade Rose, *Saturday Night*, June 1994. 175  
In 1985 one model of a *radiation therapy machine* began drastically *overdosing cancer patients*. Barbara Wade Rose explains how simple computer errors compromised the machine. She also recounts the difficulties and frustrations encountered in diagnosing and fixing the machine's problems.

28. **Liability for Defective Electronic Information**, Pamela Samuelson, *Communications of the ACM*, January 1993. 180  
Legal scholar Pamela Samuelson draws on the legal protections and *liabilities* of authors, publishers, and booksellers to outline some of the legal issues surrounding the production, publication, and distribution of *defective software* that causes economic or physical harm.

### Overview 186

29. **The Birth of a Celtic Tiger**, Seán ÓRiain, *Communications of the ACM*, March 1997. 188

Focusing on the role of multinational firms, the author describes *Ireland's information technology industry*. He argues that the state must play a stronger role in ensuring that future IT developments benefit the whole society.

30. **The Great Firewall of China**, Geremie R. Barmé and Sang Ye, *Wired*, June 1997. 194

The year 1996 was the "Year of the Internet" in China but "barely one in 10,000 Chinese is actually wired." Moreover, the government has placed strict *regulations* on Internet access. Tight restrictions may also be imposed on *Hong Kong* as it reverts to the control of mainland *China*.

31. **Singapore Sting**, Richard Rapaport, *Forbes ASAP*, April 7, 1997. 203

*Software piracy* is widespread in the Far East. This article offers insights into the underground software industry and recounts the events of an undercover sting operation in *Singapore*.

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# COMPUTERS IN SOCIETY

*Seventh Edition*



Editor

**Kathryn Schellenberg**

Kathryn Schellenberg earned a Ph.D. in sociology from the University of Utah and is presently an independent researcher and consultant based in Guelph, Ontario, Canada. One of her areas of scholarly interest is the social impacts of technology, especially computing.

She has conducted and published research on computer-related topics, including computer impacts on policing and how workers in high-tech "information" firms deal with change and uncertainty. She has also taught computers/technology and society courses at the Universities of Utah, Calgary, and Guelph.

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# Topic Guide

This topic guide suggests how the selections in this book relate to topics of traditional concern to students and professionals involved with computers in society. It can be very useful for locating articles that relate to each other for reading and research. The guide is arranged alphabetically according to topic. Articles may, of course, treat topics that do not appear in the topic guide. In turn, entries in the topic guide do not necessarily constitute a comprehensive listing of all the contents of each selection. In addition, relevant Web sites, which are annotated on the next two pages, are noted in bold italics under the topic articles.

TOPIC AREA	TREATED IN	TOPIC AREA	TREATED IN
<b>Africa</b>	32. Disconnected: Haves and Have-Nots	<b>Electronic Monitoring</b>	See Privacy and Security
<b>Artificial Intelligence</b>	35. Ghosts in the Machine 36. How Artificial Intelligence Fails (41, 42, 43, 44, 45)	<b>Encryption</b>	See Privacy and Security
<b>Artificial Life</b>	34. What's It All About, Alife? (40, 45)	<b>Ergonomics</b>	10. Working Out the Kinks (11)
<b>Asia</b>	30. Great Firewall of China 31. Singapore Sting (38)	<b>Ethics</b>	16. Law and Order Comes to Cyberspace 17. Who's Reading Your E-Mail? 18. Simulations on Trial 19. Invasion of Privacy 27. Fatal Dose 28. Liability for Defective Electronic Information 31. Singapore Sting (19, 21, 23, 24, 25, 26, 27, 28, 29)
<b>Children</b>	13. Session with the Cybershrink 14. Computer Delusion (27, 29)	<b>Etiquette</b>	8. Ripple Effect of Computer Networking 12. Finding One's Own Space in Cyberspace (16)
<b>China</b>	30. Great Firewall of China	<b>Europe</b>	29. Birth of a Celtic Tiger (39)
<b>Communications</b>	4. New Business Cycle 7. Money in Electronic Commerce 8. Ripple Effect of Computer Networking 10. Working Out the Kinks 11. Overload (5, 6, 9, 11, 18)	<b>Globalization</b>	See International Issues
<b>Crime</b>	7. Money in Electronic Commerce 16. Law and Order Comes to Cyberspace 17. Who's Reading Your E-Mail? 18. Simulations on Trial 31. Singapore Sting (6, 19, 24, 25, 26, 27)	<b>Government and Politics</b>	16. Law and Order Comes to Cyberspace 19. Invasion of Privacy 20. High Resolution, Unresolved 21. Digital Politics 22. Great Internet Tax Drain 23. Is Big Brother Hanging by His Bootstraps? 24. Warfare in the Information Age 29. Birth of a Celtic Tiger 30. Great Firewall of China (24, 26, 28, 30, 31, 32, 33, 34)
<b>Economic Issues</b>	1. Welcome to Cyberspace 3. Clicking onto Webzines 4. New Business Cycle 5. What Has the Computer Done for Us Lately? 6. Creating the People's Computer 7. Money in Electronic Commerce 22. Great Internet Tax Drain 31. Singapore Sting 32. Disconnected: Haves and Have-Nots 33. Role of Computer Networks in Development (2, 3, 4, 5, 6, 7, 8, 9, 37, 38, 39)	<b>Hackers and Hacking</b>	See Crime
<b>Education and Training</b>	6. Creating the People's Computer 13. Session with the Cybershrink 14. Computer Delusion 15. Campus of Our Own 32. Disconnected: Haves and Have-Nots (23, 29)	<b>Health and Medicine</b>	10. Working Out the Kinks 27. Fatal Dose (11)
		<b>Human Interaction</b>	1. Welcome to Cyberspace 2. Internet 8. Ripple Effect of Computer Networking 9. Virtually Working 11. Overload 12. Finding One's Own Space in Cyberspace

TOPIC AREA	TREATED IN	TOPIC AREA	TREATED IN
Human Interaction (continued)	13. Session with the Cybershrink 15. Campus of Our Own 35. Ghosts in the Machine (1, 12, 14, 15, 17, 18, 29, 34)	Networks and Networking (continued)	33. Role of Computer Networks in Development (1, 2, 6, 10, 14, 15, 17, 18, 24, 25, 27, 31, 32, 33, 34, 37)
Inequality	2. Internet 32. Disconnected: Haves and Have-Nots 33. Role of Computer Networks in Development (17, 23, 29, 32)	Office Automation	6. Creating the People's Computer 8. Ripple Effect of Computer Networking 9. Virtually Working 11. Overload 25. It's 10 O'Clock (10, 12, 13, 14, 15, 17, 37)
Intellectual Property	3. Clicking onto Webzines 16. Law and Order Comes to Cyberspace 17. Who's Reading Your E-Mail? 24. Warfare in the Information Age 28. Liability for Defective Electronic Information 31. Singapore Sting (1, 3, 7, 16, 22, 23, 24, 26, 27, 28, 32)	Philosophical Issues	2. Internet 34. What's It All About, Alife? 35. Ghosts in the Machine 36. How Artificial Intelligence Fails (1, 40, 41, 42, 44, 45)
International Issues	7. Money in Electronic Commerce 16. Law and Order Comes to Cyberspace 20. High Resolution, Unresolved 23. Is Big Brother Hanging by His Boots? 3 24. Warfare in the Information Age 26. Software's Chronic Crisis 28. Liability for Defective Electronic Information 29. Birth of a Celtic Tiger 30. Great Firewall of China 31. Singapore Sting 32. Disconnected: Haves and Have-Nots 33. Role of Computer Networks in Development (6, 15, 24, 25, 26, 31, 33, 37, 38, 39)	Politics	See Government and Politics
Legal Issues	7. Money in Electronic Commerce 16. Law and Order Comes to Cyberspace 17. Who's Reading Your E-Mail? 18. Simulations on Trial 28. Liability for Defective Electronic Information 31. Singapore Sting (6, 19, 21, 22, 23, 24, 27)	Privacy and Security	7. Money in Electronic Commerce 8. Ripple Effect of Computer Networking 17. Who's Reading Your E-Mail? 19. Invasion of Privacy 20. High Resolution, Unresolved 23. Is Big Brother Hanging by His Boots? 3 30. Great Firewall of China (6, 8, 24, 25, 26, 27, 28)
Networks and Networking	1. Welcome to Cyberspace 2. Internet 3. Clicking onto Webzines 4. New Business Cycle 7. Money in Electronic Commerce 8. Ripple Effect of Computer Networking 9. Virtually Working 11. Overload 12. Finding One's Own Space in Cyberspace 13. Session with the Cybershrink 15. Campus of Our Own 16. Law and Order Comes to Cyberspace 17. Who's Reading Your E-Mail? 19. Invasion of Privacy 21. Digital Politics 22. Great Internet Tax Drain 23. Is Big Brother Hanging by His Boots? 3 24. Warfare in the Information Age 30. Great Firewall of China 32. Disconnected: Haves and Have-Nots	Productivity	4. New Business Cycle 5. What Has the Computer Done for Us Lately? 6. Creating the People's Computer (4, 5, 9, 15, 17)
		Publishing	3. Clicking onto Webzines (3, 7, 9)
		Risks and Computer Reliability	25. It's 10 O'Clock 26. Software's Chronic Crisis 27. Fatal Dose 28. Liability for Defective Electronic Information (35, 36)
		(The) Self	13. Session with the Cybershrink 35. Ghost in the Machine
		Simulations	18. Simulations on Trial (20, 21)
		Women (and Gender) Issues	12. Finding One's Own Space in Cyberspace (12, 23)
		Working and Employment	4. New Business Cycle 5. What Has the Computer Done for Us Lately? 6. Creating the People's Computer 8. Ripple Effect of Computer Networking 9. Virtually Working 10. Working Out the Kinks 11. Overload 17. Who's Reading Your E-Mail? 19. Invasion of Privacy (10, 11, 12, 13, 14, 15, 17)

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Some Web sites are continually changing their structure and content, so the information listed may not always be available.

## Introduction

1. Short History of the Internet—<http://ubicom.com/history.html>—Bruce Sterling begins with the development of the idea for the Internet by the cold war think tank, the Rand Corporation, and goes on to explain how computer networking works. Links to other sites and to further reading.
2. Livelink Intranet Guided Tour—[http://www.opentext.com/livelink/otm\\_ls\\_test.html](http://www.opentext.com/livelink/otm_ls_test.html)—Livelink Intranet helps companies to manage and control documents, business processes, and projects more effectively. Take this tour to see how.

## The Economy

3. Cyber Cafe Hot List: Magazines and Webzines—<http://cyber-cafe/lbzne.htm>—A list of links to electronic magazines.
4. Generation Techs—<http://www.incomeops.com/online/contents9702/gentechs.html>—Generation X entrepreneurs are becoming industry giants before their thirtieth birthdays. With virtually no capital and less experience, they are at the helm of some of the technology industry's most innovative start-ups.
5. Integrated Information and Communication System—<http://www.kepco.co.kr/About/e-abt-j.htm>—On this page, an electric company, KEPCO, which is building an integrated information and communication system to deal with advancements made in the field of communication technology, tells what it has done, and what it plans for the future.
6. Mersch Online: Links zu Informationen über E-Cash—<http://www.mersch.com/links/moneyzz.htm>—This page has a good series of links to other sources of information about E-cash.
7. Site Reviews: Webzines—<http://lofgreen.com/webzines.htm>—This is an Internet site that offers reviews and ratings of selected webzines.
8. The End of Cash (James Gleick)—<http://www.around.com/money.html>—An article, previously published in the *New York Times*, on June 16, 1996, discusses the obsolescence of cash.
9. Welcome to Industry Week—<http://www.industryweek.com/>—IW is an interactive management resource, an online magazine that features columns, articles, and conference news.

## Work and the Workplace

10. HW: The Homeworking Phenomenon: Looking beyond the Hype—<http://www.homeworker.com/issue2/hype/hype.html>—Home Worker magazine talks with analyst Abhijeet Rane about the issues and challenges affecting home-based workers—and the keys to finding success.
11. STEP ON IT! Pedals: Repetitive Strain Injury—<http://www.bilbo.com/rsi2.html>—Here is an explanation of carpal tunnel syndrome

and links to alternative approaches to the computer keyboard, plus links to related information.

12. Telecommuting—<http://www.iamot.org/~chiklink/453home/html>—Here is a description of telecommuting—the convergence of work, home, and family spheres—that is particularly directed toward women in the home.
13. Telecommuting Centers—<http://www.telecommute.org/tc.html>—Explore eight telecommuting centers and find out what they have to offer the person who wants to work closer to home.
14. Telecommuting Links—<http://www.ci.chula-vista.ca.us/telecomu.htm>—Links to research papers that deal with telecommuting as well as examples of projects.
15. The International Telework Association—<http://www.telecommute.org/index.html#place>—International Information about telecommuting, the alternate route to work, and links about issues and challenges of the virtual workplace.

## Computers and Social Participation

16. The Core Rules of Netiquette—<http://www.albion.com/netiquette/corerules.html>—Excerpted from Virginia Shea's book *Netiquette*. This is classic work in the field of online communication.
17. Virtual Community in Real Reality—<http://panizzi.shuf.ac.uk/community/virtreal.html>—A realistic, if biased, look at the effects on community involvement of expanded information technology. This is an abridged version of a paper printed in *Inventing the Future, Partnerships for Tomorrow*, January 1996, by Greg Smith.
18. WorldNow Online—<http://www.worldnow.com>—This broadcast network offers consumers retail shopping, travel help, classified ads, and local community-based programming similar to that found on television networks.

## Social Values: Ethics, Law, and Privacy

19. AS: Frequently Asked Questions—<http://www.hackers.com/faq.htm>—At this Web site of Axis Security (AS), a hacking/security organization, the answers to what hacking is in hackers' own words can be found.
20. Computer Modeling and Animation—<http://www.visualdesigns.com/3dmain.htm>—Here is an example of computer-generated animation from a company engaged in this kind of production.
21. Computer Simulation and Animation in the Courtroom—<http://www.evidence.com/Articles/Animation-admissibility.html>—The new wave of computer simulation and animation in the courtroom is discussed by lawyer Richard Alexander. Links to related sites.
22. Copyright & Trademark Information for the IEEE Computer Society—<http://computer.org/copyright.htm>—Here is an example of how a publication on the Web is legally protected. The section on Intellectual Property Rights Information contains further information about reuse permission and copyright policies.
23. Cybertronics: The Geopolitics of Cyberspace—<http://www.channel.zerocom/meta/articles/geopolit.html>—Written by Blake Harris, this article is a detailed examination of the unique problems of cyber-



space. The author sees in the very nature of the information society a serious threat to the future of democracy.

24. Information Security and Privacy in Network Environments—[http://www.cypher.net/info/pub/clipper/ota\\_priv\\_sec.report](http://www.cypher.net/info/pub/clipper/ota_priv_sec.report)—Good discussion by OTA (Office of Technology Assessment) on the issues, including government security, the European Union approach, cryptography, and much more. For a list of many links with descriptive abstracts, use <http://www.cypher.net/info/pub/clipper/>.
25. Internet Privacy Coalition—<http://www.privacy.org/ipc/>—The mission of the Internet Privacy Coalition is to promote privacy and security on the Internet through widespread public availability of strong encryption and the relaxation of export controls on cryptography.
26. My Lock, My Key: Encryption Policy Resource Page—<http://www.crypto.com>—These pages are maintained for information about U.S. encryption export restrictions and the need for policy reform.
27. Safety and Security on the Internet—<http://host1.webgate.net/services9.html>—This site deals with software programs that help keep children from accessing pornography on the Net, plus other aspects of Web security, hackers, con artists, protection of privacy, and viruses.

## Politics and the State

28. ACLU: American Civil Liberties Union—<http://www.aclu.org/>—Click on the Supreme Court's Internet decision, plus details of the case, *Reno v. ACLU*, ACLU's campaign to restore information privacy, "Take Back Your Data," and cyber-liberties and free speech for opinion on First Amendment rights as they apply to cyberspace.
29. Comstockery in Cyberspace—<http://arfo.wilsonhs.pps.142.or.us/comstock.html>—This discussion by Janet Murray of the use of the Internet in schools leads to Child Safety on the Information Highway, which has many links to parent/child/school issues.
30. Congress vs. Free Speech on the Internet—<http://www.info-nation.com/congress.html>—This is a general discussion by Chris Sandberg, an attorney who practices telecommunication and computer law, about Congress's position on the Internet.
31. Firewall-Cyberwar—<http://ns.annex.co.uk/software/cyberwar.html>—The U.S. military considers foreign attack on U.S. computer systems a real risk. This article discusses the threat of this new kind of warfare.
32. Issues in Telecommunication and Democracy—<http://www.benton.org/Library/TeleDemocracy/working8.html>—This article, prepared under the aegis of the Benton Foundation, discusses the issues surrounding telecommunications in the twenty-first century and concludes that, if designed with care, the new age can help realize "the enduring democratic promise."
33. Patrolling the Empire—<http://www.csrp.org/patrol.htm>—Reprinted from *CovertAction Quarterly*, this article by Randy K. Schwartz details the plans of NIMA (National Imagery and Mapping Agency) for future wars by helping to fuse high-tech surveillance and weaponry, according to the author.
34. Riley Information Services: Living in the Electronic Village—<http://www.rileyis.com/publications/phase1/execsumm.htm>—The Impact of Information in Technology on Government is the subtitle of this online book. Shown is the executive summary. Seven other sections are equally pertinent. Explore this entire site by clicking back and forth for this book and its sequel, Phase II.

## Technological Risks

35. Georgia Tech Year 2000 Millenium Bug Guide—<http://www.gatech.edu/year2000/>—An important Year 2000 site with links to many other sites that are concerned with the last-two-digit millenium bug, which concerns both hardware and software.
36. Yahoo-Computers and Internet: Year 2000 Problem—[http://www.yahoo.com/Computers\\_and\\_Internet/Year\\_2000\\_Problem/](http://www.yahoo.com/Computers_and_Internet/Year_2000_Problem/)—Excellent list of sources on the Year 2000 problems and possible solutions. Has search capability and links.

## International Perspective and Issues

37. GUIDE International—<http://www.guide.org/>—GUIDE International is the premier IBM user group for the management and use of information technology. Click on "How to Align Quality Objectives and Business Strategies" for Table of Contents and abstract of this book.
38. India: New Software Opportunities—<http://www.3seblr.soft.net/indianit.html>—This is the site of the Indian IT industry, which is planning for enormous growth in software development plus increased interaction with European countries.
39. Mission Statement—<http://nautilus.netcmi.co.uk/company/mission.htm>—CMI's mission, as stated here, is to become Northern Ireland's most respected independent provider of computer services.

## Philosophical Frontiers

40. Artificial Life Games Homepage—[http://gracco.irmkant.rm.cnr.it/luigi/lupa\\_algames\\_res.html](http://gracco.irmkant.rm.cnr.it/luigi/lupa_algames_res.html)—This Artificial Life Games Homepage leads to many exciting adventures, for example, robot-related sites, alife (artificial life) games, simulators, and demo programming.
41. Computer Chess Feature: Kasparov vs. Deep Blue Rematch—<http://www.chess.net/computerchess.html>—A discussion of the historic rematch between Garry Kasparov and Deep Blue also considers how to work with artificial intelligence effectively.
42. CS327: Artificial Intelligence—[http://hamming.mathcs.carleton.edu/courses/courses\\_resources/cs327.html](http://hamming.mathcs.carleton.edu/courses/courses_resources/cs327.html)—Link to facts about the book *Artificial Intelligence: A Modern Approach*.
43. IEEE Robotics and Automation Society Home Page—<http://www.acim.usl.edu/RAS/>—Information about robotics within the Institute of Electrical Engineers' RAS (Robotics and Automation Society), as well as links to other associations, government, industry, publishing, and university sources and sites.
44. Introduction to Artificial Intelligence (AI)—<http://www-formal.stanford.edu/jmc/aiintro/aiintro.html>—A statement of what AI is. Click on John McCarthy's home page for a list of additional papers.
45. WWW Resources—<http://alife.santafe.edu/alife/www/>—Start here to find links to many alife (artificial life) Web sites, including demonstrations, research centers and groups, and other resources.

We highly recommend that you review our Web site for expanded information and our other product lines. We are continually updating and adding links to our Web site in order to offer you the most usable and useful information that will support and expand the value of your Annual Editions. You can reach us at: <http://www.dushkin.com/annualeditions/>.

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# Introduction



**W**e often read and hear these days about the computer or information revolution. The *Concise Oxford Dictionary* defines a "revolution" as a "complete change, turning upside down, [or] great reversal of conditions" as in the example of the Industrial Revolution. In a thought-provoking book titled *The Micro Millennium*, the late British computer expert Christopher Evans observed that the Industrial Revolution:

brought about immense shifts in all aspects of society, affecting the individual, his family, his neighbors, his domestic and working environment, his clothes, his food, his leisure time, his political and religious ideals, his education, his social attitudes, his life-span, even the manner of his birth and death. (1979:ix)

Evans claimed not only that the societal impacts of computers would rival the effects of the Industrial Revolution but that we are not free to choose the future. He argued that when we began to apply these powerful new tools to the tasks of bettering our lives, we set in motion a process that took on an independent, unstoppable momentum.

There are those who scoff at the idea of being swept up in a revolution or at least dispute the claim that we have no control over the future. For instance, in his book *Personal Computer Book*, Peter A. McWilliams argued that while computers will have a dramatic impact on our lives, humans are in command of their own fate:

For the most part, personal computers will prove their worth to the extent that they fit into your daily life, not

to the degree that you adapt your life to be more in step with The Computer Age. (1984:15)

Contradictory predictions about the implications of computing are not surprising since people operate from different premises about society and human nature. We need to keep this in mind when we try to make sense of competing claims about the future. This is not easy because we are often unaware of our own assumptions about social life. Mostly, we just tend to take certain things for granted and believe them so strongly we simply assume other reasonable and intelligent people see things the same way.

However, if you believe people are fundamentally honest, generous, and altruistic, it is just as clear to someone else that people are basically greedy, self-interested, and manipulative. If you take it for granted that an orderly, stable society is the result of people cooperating and working toward the common good, there are others who would argue that power and coercion bind society together. If you are convinced people have free will to create the kind of society they value, others are more inclined to think that the nature of society is determined by forces beyond human will. And, if you believe "idealism" governs society, others are persuaded that we live in a "material" world.

The contrast between the views of Evans and McWilliams basically reflects the difference between how idealists and materialists look at the world. Those who feel that idealism and free will govern society are uncomfortable with claims that cultural, political, or religious ideals are shaped by technical innovation. They would argue that ideals come first and are the foundation of society. Technology's innovations are accepted or rejected depending on whether they harmonize with basic values. This assumption is implied in McWilliams's argument that computers are mere tools, which people are free to adopt or reject. Materialists, on the other hand, insist that new technologies need not support any basic belief system. They maintain that if a technology can provide real material benefits, such as greater wealth or longer life expectancy to society or to a powerful minority, it will be adopted. If some aspect of the technology clashes with society's values and ideals, then the values, not the technology, will be modified or abandoned. Clearly, Christopher Evans is in the materialist camp.

Social theorists and philosophers have debated for centuries over which of the competing social assumptions is valid. Like the rest of us, they continue to disagree about where the truth lies. The articles in this seventh edition of *Computer Studies: Computers in Society* do not put these issues to rest. But they do show us that technology and cultural ideals influence each other in complex, and sometimes strange, ways.

The articles that introduce this edition center on the potential implications of computer networking. Philip Elmer-DeWitt sets the stage by welcoming us to "cyberspace." He acquaints us with the information infrastructure that makes up cyberspace as it exists now and how it might look in the future. Elmer-DeWitt refrains from drawing conclusions, but he concedes that the model of cyberspace "may—just may—be a vehicle for revolutionary change."

In the following two-part article, several prominent social thinkers were asked to comment on the computing-information revolution. In the first report, the outspoken and controversial social critic Camille Paglia rhapsodizes over her view that "the era of digital technology is simply a continuation of the Enlightenment, that splendid rebirth of Greco-Roman science." Paglia sees greatly expanded personal liberties among the benefits of this transformation. In the second essay, Richard John Neuhaus, a Roman Catholic priest, is more skeptical about the potential extent of change and about how beneficial those changes will be. He argues, rather, that the high-decibel noises about a technological revolution . . . [tend to] confuse information with knowledge and knowledge with wisdom. And as for new liberties, Neuhaus reminds us that we will retain "inescapable responsibility for what we do and are."

### Looking Ahead: Challenge Questions

If we discover that we really dislike some of the social changes that result from new technologies, can we discard our inventions or channel their effects to more desirable ends? Why or why not?

The ultralibertarian versus traditional ideals espoused by Camille Paglia and Richard Neuhaus underscore the diversity of values that exist in society. If we have a choice about which technologies are developed and how they are used, how could we resolve conflicts between groups with strongly opposing values and objectives?