Introduction

Social Dimensions of Information Technology: Issues for the New Millennium

G. David Garson
North Carolina State University

This anthology brings together twenty essays on the social dimensions of the revolution in information technology (IT). The essays, revised and updated versions of papers that originally appeared in the *Social Science Computer Review*, cover the social, political, educational, personal, and international dimensions of information technology impacts. While no pretense is made that they represent comprehensive coverage of the epochal implications of computing and the new information technologies that have accelerated every aspect of human life, taken collectively these papers raise important issues with profound implications for public policy and societal development.

The first two essays, dealing with the social dimension of information technology issues, treat from opposing perspectives the relation of information technology to social capital formation. Anita Blanchard and Tom Horan, in "Virtual Communities and Social Capital," examine Robert Putnam's theory of social capital — a theory that attempts to explain the effect of decreasing community participation and civic engagement on declining performance of governmental institutions. In particular, they appraise the speculation that emerging virtual communities can counteract the erosion of social capital. They conclude that social capital and civic engagement will increase when virtual communities develop around physically based communities and when these virtual communities foster additional communities of interest. In a related essay on "Human Capital Issues and Information Technology," Byron L. Davis and Edward L. Kick, using educational institutions as a case in point, discuss how several "mega-forces" impact institutional functioning. They note that sociologists have long cautioned against the sort of rapid technological changes that outstrip human ability to successfully adapt to them. "Cultural lag" is in some measure inevitable, they conclude, but when social change is drastic, the consequences for the human condition, as well as human capital, can be pernicious in the extreme.

The remaining two essays in this volume's section on the social dimension of information technology address an issue central to social science, considerations in

predicting the direction of social impacts of information technology change. In "The Progress of the Internet," sociologist Grant Blank emphasizes the difficulties of predicting social outcomes of the information revolution. By simplifying communication, the Internet is causing significant, broad changes, but Blank points out that although the technical implications of an innovation are predictable, the major social implications often do not become apparent for years. In the ensuing essay, "The Co-Evolution of Society and Multimedia Technology," James Stewart and Robin Williams speculate on an appropriate research framework that focuses attention on the key social, psychological, political and economic influences on technology and technology use, and the emergence of stable uses, infrastructures, standards and development paths. The paper critiques "technological determinist" approaches, which simply seek to extrapolate social change from technological potential. Rather, Steward and Williams show how a three-layer model of component, systems and application technologies can be used to integrate findings from the use and development of technology in specific sectors and they discuss this model with respect to a series of cases.

The second section of the anthology deals with the political dimension, led off by a case study by Patrick Novotny of the 1996 elections as the first presidential contest using information technology on a large scale. In "The World Wide Web and Local Media in the 1996 Presidential Elections," Novotny concludes, somewhat pessimistically, that while our globalized, information-driven economy holds great, even unimaginable possibilities for the first generation of Americans in the next millennium, for now the record is that it does little to reverse key trends in American politics that continue to push the turnout of voters down and "threaten to weaken our citizenry's support for the political process even further." As an explanation for these findings, illustrated for the case of electronic networking in a small community, in "Electronic Communities: Assessing Equality of Access" by Eric Riedel and his coauthors, find "existing socioeconomic inequalities are replicated with regards to computer ownership and use...the community electronic network replicates not only economic stratification in the community but the social structure as well."

In a final essay in the section on the political dimension of information technology, Brian M. O'Connell, writing in "Ethics, Law, and Information Technology: The Transformative Role of Rhetoric," decisions. O'Connell explores how information technology can shape public discourse and proposes that it has the powerful capacity to determine outcomes and to shape modern concepts of individual as well as societal freedoms and rights. Steven M. Schneider, in "Creating a Democratic Public Sphere through Political Discussion," also examines the nature of computer-mediate political discourse, using the example of an electronic community centered on abortion issues. Schneider finds a high level of inequality in participation among conversants, with very few of the discussants responsible for an extraordinarily high proportion of the content. This inequality, he concludes, calls into question the democratic character of the public sphere represented by this form of public discourse.

Turning to the educational dimension of the social impacts of information technology, four essays discuss how IT is changing academia. First, Brian Kroeker, writing in "Changing Roles in Information Dissemination and Education," discusses the impact of information technology on the library as the core institution of the university. He concludes that the World Wide Web will impact greatly upon the library whether the library wants it to or not, and this impact will be in large part be dictated to the library by forces both technologically and socially based, and thus beyond the library's overall control. He

speculates that the Web is changing the balance between the library as provider of information and teaching faculty as providers of education.

In "Technological Change, Virtual Learning, and Higher Education," Mark A. Shields paints a less than optimistic picture of the educational impacts of technology, holding with Thoreau that "As with our colleges, so with a hundred 'modern improvements'; there is an illusion about them; there is not always a positive advance. They are but improved means to an unimproved end...." G. David Garson, in "The Role of Information Technology in Quality Education," traces the attempt to define quality standards for computer-mediated education and he, too, finds himself far from the technology enthusiasts among today's educators. Garson commends the use of technology as an adjunct to rather than replacement of traditional education but notes the high cost of such a dual model is likely to lead to "the emergence of a two-tier educational system—a more expensive upper tier with sound traditional education supplemented with the benefits of full on-line access, and a cheaper inferior tier dispensing programmed training which meets objectives far narrower than the traditional goals of liberal education." Concluding this section, Paula Lackie, in "The Paradox of Paperless Classes," discusses in practical detail the difficulties associated with implementing on-line education.

The fourth section of this anthology deals with the personal dimension of information technology, at home and work. John Robinson and his associates, in "Personal Computers, Mass Media, and Other Uses of Free Time," reports the results of a major survey of the personal uses of computing. The authors find that contrary to the fears of many, there is no consistent evidence of time displacement with regard to computing and the web. Heavier computer usage was associated with significantly greater rather than less use of print media and other cultural uses of free time, even after multivariate adjustment. They conclude that at this early stage of diffusion, personal computers may have more in common with "time enhancing" home appliances (like the telephone, automobile and washing machine) than with television.

In "Manufacturing Knowledge: Technology, Culture, and Social Inequality at Work," Steven Vallas paints a more pessimistic view with regard to the workplace. In an important case study, Vallas finds that professional employees engaged in subtle yet important efforts to portray manual workers' knowledge in derisive terms, to institute credential barriers, and to shift control over analytic functions into their own "natural" domain. The study suggests that symbolic representations can have powerful consequences for the restructuring of work, reproducing social inequalities even when new technologies render them unnecessary. Finally, in the last section on personal computing in the home and workplace, Nicole B. Ellison presents the results of her survey of the literature, "Researching Telework: Past Concerns and Future Directions," discusses such issues as whether telecommuting will empower or exploit women and other sectors of society.

The final section of the anthology treats the international dimension of information technology. The international setting is the arena in which the greatest inequalities of the "information society" are present. In "The Information Age: Apartheid, Cultural Imperialism, or Global Village?" R. Alan Hedley comes to two major conclusions: 1) the information revolution is still very much in its beginning stages; and 2) it is limited primarily to the developed nations of the North. However, efforts in the North may nonetheless benefit nations in the South. Karina Funk, in "Networking for Sustainable Development: Innovative Approaches Outside the 'Global Village'," reviews novel initiatives for improving the content of information on sustainable development and novel initiatives for increasing

access to this information with an emphasis on outreach to rural areas in developing countries. Some of the incongruous objectives of a global communications network are explored, as well as the associated opportunities to encourage more informed decision-making for information technology investments and sustainable development endeavors.

On the same theme, Roger Pfister, in "Africa's Right to Information: Past, Present, and Future," outlines initiatives and discussions on information technology in Africa from the 1960s to the 1980s. The second part deals with the new communication technologies, the areas of application in Africa and their possible impact on Africa's development. The author takes a rather pessimistic attitude as far as the advancement of sustainable development in Africa through information technology is concerned.

In "World Information Flows and the Impact of New Technology," Australian social scientist Kerry Ferguson discusses how the new technology at the disposal of emerging communication conglomerates is creating ever-increasing world information flows, which are changing political, economic and cultural landscapes, and redefining work, education and development. Her article argues that an international communication policy is necessary to ensure the world does not divide into the information rich and the information poor.

Finally, in an important article titled "International Network for Integrated Social Science," William Sims Bainbridge, a sociologist and Science Advisor to the Directorate for Social, Behavioral and Economic Sciences of the National Science Foundation, discusses how computer-related developments across the social sciences are converging on an entirely new kind of infrastructure that integrates across methodologies, disciplines, and nations. This article examines the potential outlined by a number of conference reports, special grant competitions, and recent research awards supported by the National Science Foundation. Together, these sources describe an Internet-based network of collaboratories combining survey, experimental, and geographic methodologies to serve research and education in all of the social sciences, providing an unprecedented collection of resources available to social scientists on an international basis.