This article interweaves the ideas of sustainable development, sustainable societies, and the power of advanced information technologies toward developing recommendations for social science research on information technology in society. Worldwide concern has arisen over the potentially catastrophic consequences of global climate and environmental change. As a result, sustainable development (i.e., the simultaneous protection of both the global environment and the global economy) is receiving considerable attention. Necessary for achieving sustainable development are sustainable societies, which are capable of designing, implementing, managing and evaluating long-term environmental programs. This article presents ten characteristics that describe sustainable societies and discusses how information technologies, from wireless personal digital assistants to intelligent agents to multi-media database systems, could support the evolution of sustainable societies. Topics for social science research related to designing and ameliorating the negative consequences of eight hypothetical computer-based systems are presented.

Introduction

The purpose of this article is to outline aspects of a social science research agenda related to the study of information technology in society. In general, social scientists have shown an ambivalence toward computing (Anderson and Brent 1991). This is unfortunate because information technology, broadly defined to include computer and telecommunications technology, is affecting life in almost every community on earth. Even more important, the prospects for...
continued rapid and possibly qualitatively different change are great (Negroponte 1995). From a technologist's future-oriented viewpoint, one can envision computer-based systems (CBSs) of the twenty-first century that will provide people virtually unlimited assistance in archiving, communicating, thinking and problem solving, and in organizing human behavior. Such capabilities could have unprecedented positive and negative impacts on societies.

It is true that this vision of the future of information technology will not become reality in the very near-term. Many software problems are proving more daunting than first thought, and enormous sums of money must still be invested to upgrade telecommunications networks in the developed world and to establish networks in many parts of the developing world. However, it is also true that the world is moving inextricably toward this vision, with or without the insights and assistance of social scientists. Databases are coming on-line, communication over the Internet is worldwide, distance learning is becoming common, wireless communication is growing, and multinational corporations already rely heavily on their satellite and internal digital information systems. Given the long-term nature of social science research, it is essential to fashion a social science research agenda around inevitable advances in information technology rather than around soon to be obsolete technology.

Long-term social science research on relationships between information technology and societies must take place within a context because computer-based systems (CBSs) are designed to achieve specific goals. Example contexts include: the classroom; the workplace; government services; and health care. The information technology context for this article, global environmental change, has not received rigorous attention and poses immense challenges for social science. Problems such as global warming, ozone depletion, species extinction, desertification, acid rain, hazardous waste, and groundwater contamination pose substantial risks to current and future generations and to the world's ecosystems (Gore 1992). The specter of global environmental catastrophe led to the unprecedented gathering of the world's leaders in Rio de Janeiro, Brazil, in June 1992, for the first United Nations Conference on the Environment, which is commonly known as the Earth Summit. One communique ratified at the Earth Summit, known as AGENDA 21 (Sitarz 1993), contains numerous recommended actions that could benefit from the use of information technology.

Social science must take an active part in the process of developing CBSs to support efforts in the global environmental change area for several reasons. One reason is because the implementation of CBSs entails more than writing code and configuring hardware. Much more so than systems designed for business environments, CBSs designed within the context of global environmental change will be used by people from different cultures and all stations of life. Social scientists can envision better than information technologists and other non-social scientists working the area of global environmental change how societies and information technologies can be synthesized to achieve global environmental goals. In addition, CBSs may have adverse social consequences, which social scientists may have some ability to foresee. Misuse of technology is as critical an...