

Comprehensive Examination Area: Technology, Society, and Development

By Abu Jafar Md. Shafiu Alam Bhuiyan

Supervisor: Prof. Ellen Balka

This comprehensive examination area deals with the complex interrelations between technology, society, and development. It is divided into two sections. The first section attempts to conceptualize the origin of the information society idea by reviewing the competing views about the "Information Society". And the second section examines the role of information technologies in socio-economic development.

Part I

Multiple metaphors, such as the "Information Society", the "Post-industrial Society", the "Knowledge Society", the "Network Society", the "Programmed Society", the "Computer Age", the "Third Wave", and the "Pay-per Society", have been used to designate the advanced capitalist societies. Although each metaphor has been developed by playing up a certain aspect of the contemporary advanced capitalist societies, they all suggest that advanced capitalist societies have entered into a new phase where the possession, production, and distribution of information suddenly have become valuable. And the most of them imply that the manufacturing economy has transformed into an information economy. To avoid confusion in this comprehensive examination, I use the term "Information Society" to identify the advanced capitalist societies.

Both information and Information Society have been defined from various perspectives in Information Society literatures. Information has been defined as a resource, a commodity, a form of knowledge, and a constitutive force of the society (Braman, 1989). On the other hand, the Information Society has been defined from technological, economic, occupational, spatial, cultural, and control as well as surveillance perspectives (Webster, 1995). Webster notes that although particular theorists highlight one or the other aspect in their analyses, these perspectives are not "mutually exclusive". For example, Machlup (1962) and Porat (1977) focus on the changes in the economy; Bell (1973) concentrates on the importance of technology, technical knowledge, and occupational change; Touraine (1971) looks into the organizational and occupational aspects; Castells (1996) explains the networking aspect and global dimension; and Beniger (1986) examines how control over socio-economic life is reestablished in the Information Society. All these perspectives have something to contribute to our understanding of the changes in advanced capitalist societies.

I use this comprehensive examination to know briefly about the various aspects of the information society thesis. To achieve this goal, I intend to review two central, interrelated debates on the origin of the Information Society. The first debate is about the causes of change in the advanced capitalist societies (Schement and Curtis, 1995). Many theorists, such as Daniel Bell, Fritz Machlup, Marc Porat, Peter Drucker, Manuel Castells, Alvin Toffler, and Yuneji Masuda, believe that the invention and use of new information technologies, mainly computer, has transformed the industrial societies into information societies. By contrast, critics of the information society thesis, such as Herbert Schiller, Vincent Mosco, and Gerald Sussman, argue that the contemporary changes in industrial societies need to be understood as an outcome of interplays between capital and technology.

The second debate is known as the continuity-difference controversy (Webster, p. 4). Many theorists, including Daniel Bell, Mark Poster, Manuel Castells, Scott Lash, and Peter

Drucker, subscribe the notion that the Information Society is completely different from hitherto existing societies. In the Information Society, information triumphs over goods, the service economy replaces manufacturing economy, service workers outnumber manufacturing workers, a new class—professional and technical class—emerges as a dominant social group, technical knowledge dominates, old forms of power relations evaporate, and social progress depends on the creation and management of information as well as new information technologies. Alternatively theorists, such as Herbert Schiller, Vincent Mosco, Gerald Sussman, and James Beniger, argue that while there is no doubt about the significance of information and information technologies in the contemporary society, the central feature of the society—social relation/production relation—retains continuity with the past. Social relation in the so-called Information Society is predominantly a capitalist one. Capital has expanded its outreach to every aspect of the society. Information as well as information technologies have been transformed into lucrative commodities and have been used to produce other commodities.

This comprehensive examination area reviews these debates by including relevant literatures from the both sides.

Part II

In this section I intend to deal with the relationship between technology, particularly information technology, and development. The development of underdeveloped regions became a global program immediately after the Second World War. American President Truman is credited as the originator of the concept of development. Truman in his inaugural speech as president of the United States on January 20, 1949 appealed to the American people and the world to solve the problem of the “underdeveloped” regions of the world (Escobar, 1995). Escobar writes:

The Truman doctrine initiated a new era in the understanding and management of world affairs, particularly those concerning the less economically accomplished countries of the world. The intent was quite ambitious: to bring about the conditions necessary to replicating the world over the features that characterized the “advanced” societies of the time—high levels of industrialization and urbanization, technicalization of agriculture, rapid growth of material production and living standards, and the widespread adoption of modern education and cultural values. In Truman’s vision, capital, science, and technology were the main ingredients that would make this massive revolution possible. (p. 4-5)

After Truman’s declaration, many international bodies including the United Nations took initiatives to develop the “underdeveloped” world. Almost every state in the “Third World” participated in this process and endeavored to develop their individual societies.

Since the late 1940s we have seen the emergence of many development theories such as modernization, dependency, and world systems to deal with the “underdevelopment” of “Third World” countries. Modernization theory was developed by American academics and development experts in line with the Truman doctrine. The main objective of modernization theory was to build industrial societies in the “Third World” by introducing western technology and lifestyle. It identified traditional cultures and the lack of capital as well as modern technology as the prime obstacles to the development of “underdeveloped” countries. Proponents of this theory argued that the application of western technologies, availability of foreign aid, and the adoption of western lifestyle will solve the problem of poverty and

hunger in the "Third World" by stimulating economic growth. However, Escobar (p. 215) argues that during the last 50 years the modernization project failed to deliver the promised good. Rather in many cases poverty and hunger and social inequality increased and the world had experienced some of the worst environmental disasters of the century.

Other critics have come up with alternative theories of underdevelopment. For example, in the 1960s Latin American scholars proposed a new theory called 'dependency theory' which asserts that developed countries are responsible for the underdevelopment of "underdeveloped" countries and suggested political "transformation within the underdeveloped countries and 'delinking' of their economies from the world market" (Hettne in Desai and Potter, 2002). In the early 1970s Immanuel Wallerstein proposed a theory known as world system perspective by documenting the weak position of such countries in the world economy. In spite of the availability of alternative development theories, modernization theory has always been dominant throughout the world. Under the influence of modernization theory development has been understood as economic growth, increases in per capital income, and achieving a living standard equivalent to that of industrialized countries (Mansell and When, 1998). Like modernization theory, this definition of development has been criticized for being ethnocentric and for ignoring the other aspects of life such as culture and environment.

Although modernization theory has fallen out of favor in the academia, its definition of development tends to exist till today in a modified form. Development still refers to economic growth, but the ways and means of achieving it is supposed to be tailored without damaging cultural diversity and environment. It has been recognized that every society needs to define its own development goals and figure out the ways of achieving them.

When the world is mourning the death of the modernization project, in the 1990s another visionary, former US Vice President Al Gore, came up with a new idea for world development. He suggested that we have to harness the potential of information technologies to build a better society. The information superhighway created by information technologies is said to be the center of all future economic and social activities. Similar to Truman's idea, Gore's vision also received worldwide attention. Many western countries have already taken initiatives to build information societies. The ITU, a UN body, is now in the process of completing a world summit involving representatives from various sectors including state, business, and civil society to figure out how to make information societies throughout the world. The information society project and modernization project are similar to and different from each other in many ways. In the case of the modernization project, Truman announced the vision and western intellectuals came up with the theoretical framework to justify the vision. On the contrary, in the case of the information society project western intellectuals developed the theoretical framework, and Gore and Clinton Administration made this a global phenomenon. The main similarity between these two projects is that they both rely heavily on the potential of technology. This time the reliance is on information technologies, more specifically on informatics developed out of the marriage between computing and telecommunication technologies. The market is believed to be the guiding force in the implementation of the information society project.

It has been argued that information technologies can lead to a better society, the Information Society, by building social and intellectual capital (Simpson, 2004) and strengthening the economy by increasing productivity and developing new services (Freeman, 1996a & 1996b; Zappacosta, 2001). This optimism is premised on either one of the two weak

views of technology/society relationship—technological neutrality and technological determinism. The thesis on technological neutrality implies that technology is a neutral tool, and it can be used for socio-economic development. Feenberg (2002) calls it an instrumentalist view of technology. This position neither recognizes the social effects of technology nor the role of socio-economic forces in design, development, and diffusion of technology. On the other hand, the thesis on technological determinism asserts that technology is a benevolent, powerful force and has potential to change the society. Feenberg (p. 138-139) notes that technological determinism rests on the following assumptions:

1. The pattern of technical progress is fixed, moving along one and the same track in all societies. Although political, cultural, and other factors may influence the pace of change, they cannot alter the general line of development that reflects the autonomous logic of discovery.
2. Social organization must adapt to technical progress at each stage of development according to “imperative” requirements of technology. This adaptation executes an underlying technical necessity.

This position—technological determinism—ignores the role of social and economic forces in design and implementation of technology.

The information society project is also baffled by two disturbing trends. First, information technologies have already been colonized by the capitalist forces which treat both information and information technologies as commodities. Big businesses are the main producers and users of information technologies (Webster and Robins, 1986). The way information technologies have been used so far suggests that it is a tool for profit making, not for making a better society. Neo-Marxist technology theorists such as Harry Braverman and David Noble also support this position. Neo-Marxist perspective, which belongs to a broad theoretical stream known as social shaping of technology, argues that the design and implementation of any technology is determined by dominant social forces. It argues that technology is neither neutral nor autonomous. It recognizes that technology has an impact on the society, but asserts that the design of technology and the role of technology in society are determined by broader socio-economic processes (Mackay, 1995). Proponents of this perspective developed their theories by exploring the labor process which embraces the issues of work automation, deskilling and reskilling of labor, employment and unemployment, and productivity. For example, Braverman, the pioneer of the labor process study, has documented how technology has been used under capitalist work relations to deskill the labor force (Braverman, cited in Mackay, p. 43). Technology historian David Noble has shown how technologies are designed carefully to exert control over the workforce (Noble, 1978). All these studies suggest that if the present trends of technology development and control persist, the dream of building information societies will remain unrealized.

The second disturbing trend is known as “digital divide”. In every society, there is a gap between the information haves and the have-nots. Compared to developed countries, this gap is huge in developing countries. The application of information technologies tends to exacerbate the existing social inequality.

Therefore, it is necessary to examine how and with what purpose technologies are produced and controlled to understand the viability of the information society project, the new development goal. A review of theories on technology/society relationship and an assessment of the contradictory trends can serve this purpose.

As a whole, this comprehensive examination critically reviews the literatures on the origin of the information society and assesses the viability of the information society project by examining the theories of technology/society relationship and underdevelopment (e.g. modernization, dependency, and world system perspective). It also explores the discontents of the information society.

Reading List

Akutsu, Y. (1978). The Japanese path toward an information society. In Alex S. Edelstein et al (Eds.), *Information societies: Comparing the Japanese and American experiences* (pp. 191-194). Seattle: International Communication Center, School of Communications, University of Washington.

Babe, R. (1995). *Communication and the transformation of economics: Essays in information, public policy, and political economy*. Boulder, Colorado: Westview Press.
Chapter 1: Information industries and economic analysis: Policy-makers beware, Chapter 2: Commodities as signs, Chapter 3: The place of information in economics.

Balka, E. (1996). Women and computer networking in six countries. *The Journal of International Communication*, 3(1), 66-84.

Bell, D. (1973). *The coming of post-industrial society: A venture in social forecasting*. New York: Basic Books.
Chapter 1 (From industrial to post-industrial society), Chapter 2 (From goods to services), and Chapter 3 (The dimensions of knowledge and technology).

Beniger, J. R. (1986). *The control revolution: Technological and economic origins of the information society*. Cambridge: Harvard University Press.
Chapter 6 (industrial revolution and the crisis of control), Chapter 8 (revolution in control of mass consumption), Chapter 10 (Conclusions: Control as engine of the information society).

Bijker, W. E. (2001). Understanding technological culture through a constructivist view of science, technology, and society. In S. H. Cutcliffe & C. Mitcham (Eds.), *Visions of STS: Counterpoints in science, technology, and society studies* (pp. 19-33). New York: SUNY Press.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York: Greenwood Press.

Braman, S. (1989). Defining information: An approach for policymakers. *Telecommunications Policy*, 13(3), 233-242.

Caffentzis, G. (1997). Why machines cannot create value; or, Marx's theory of machines. In Jim Davis et al (Eds.), *Cutting edge: Technology, information capitalism, and social revolution* (pp. 29-56). London: Verso.

- Castells, M. (1996). *The information age, Vol. I (The rise of the network society)*. UK: Blackwell.
- Castells, M. (1997). *The information age, Vol. II (The power of identity)*. UK: Blackwell.
Conclusion (Social change in the network society).
- Castells, M. (1998). *The information age, Vol. III (End of millennium)*. UK: Blackwell.
Chapter 2 (The rise of the fourth world) and conclusion (Making sense of our world).
- Chandler, D. (Accessed 04/11/2000). Technological or media determinism. Available at
www.aber.ac.uk/media/Documents/tecdet/tdet03.html
- Clement, A., & Shade, L. R. (2000). The access rainbow: Conceptualizing universal access to the information/communications infrastructure. In Michael Gurstein (Ed.), *Community informatics; Enabling communities with information and communications technologies* (pp. 33-51). Hershey USA: Idea Group Publishing.
- Cornford, J., G., A., & Richardson, R. (2000). Regional development in the information society. In K. Ducatel, J. Webster, & W. Herrmann (Eds.), *The information society in Europe: Work and life in an age of globalization* (pp. 21-44). Lanham: Rowman & Littlefield Publishers.
- Desai, V. & Potter, R. B. (2002). *The companion to development studies*. London: Arnold.
- Drucker, P. F. (1968). *The age of discontinuity*. New York: Harper & Row.
Part I (The knowledge technologies) and Part IV (The knowledge society).
- Dyer-Witheford, N. (1999). *Cyber-Marx: Cycles and circuits of struggle in high technology capitalism*. Urbana & Chicago: University of Illinois Press.
- Edge, D. (1995). The social shaping of technology. In Nick Heap et al (Eds.), *Information technology and society: A reader* (pp. 14-32). London: Sage.
- Ellul, J. (1967). *The technological society* (translated by John Wilkinson). New York: Alfred A. Knopf.
Chapter 1 (Techniques).
- Elmer, G. (2003). A diagram of panoptic surveillance. *New Media & Society*, 5 (2), 231-247.
- Escobar, A. (1995). *Encountering development: The making and unmaking of the Third World*. Princeton: Princeton University Press.
- Esteva, G. (1992). Development. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (pp. 6-25). London: Zed Books.
- Feenberg, A. (2002). *Transforming technology: A critical theory revisited*. Oxford: Oxford University Press.

- Fitzpatrick, T. (2002). Critical theory, information society, and surveillance technologies. *Information, Communication & Society*, 5(3), 357-378.
- Franklin, U. M. (1999). *The real world of technology* (revised ed.) Toronto: Anansi.
- Freeman, C. (1996a). The two-edged nature of technological change: employment and unemployment. In William H. Dutton (Ed.), *Information and communication technologies: Visions and realities* (pp. 19-36). Oxford: Oxford University Press.
- Freeman, C. (1996b). The factory of the future and the productivity paradox. In William H. Dutton (Ed.), *Information and communication technologies: Visions and realities* (pp. 123-142). Oxford: Oxford University Press.
- Fuglsang, L. (2001). Three perspectives in STS in the policy context. In S. H. Cutcliffe & C. Mitcham (Eds.), *Visions of STS: Counterpoints in science, technology, and society studies* (pp. 35-49). New York: SUNY Press.
- Gandy, O. H. (1989). The surveillance society: Information technology and bureaucratic social control. *Journal of Communication*, 39 (3), 61-76.
- Glaeser, E. L. (2001). The formation of social capital. *isuma: Canadian Journal of Policy Research*, 2(1), 34-40.
- Gurstein, M. (2000). Introduction (Community informatics). In M. Gurstein (Ed.), *Community informatics: Enabling communities with information and communications technologies* (pp. 1-30). Hershey USA: Idea Group Publishing.
- Hartmann, G. et al (1995). Computerized machine tools, manpower consequences and skill utilization: A study of British and West German manufacturing firms. In N. Heap et al (Eds.), *Information technology and society: A reader* (pp. 126-134). London: Sage.
- Heeks, R. (2002). Information systems and developing countries: Failure, success, and local improvisations. *The Information Society*, 18, 101-112.
- Howard, R. (1985). *Brave new workplace*. New York: Penguin.
Introduction (work, technology, and utopia) and Chapter 2 (contradictions of control).
- Huws, U. (1999). Material world: The myth of the weightless economy. In L. Panitch and C. Leys (Eds.), *Socialist Register (Global capitalism versus democracy)* (pp. 29-55). New York: Monthly Review Press.
- Huws, U. (2001). The making of a cybertariat? Virtual work in a real world. In L. Panitch and C. Leys (Eds.), *Socialist Register (Working classes global realities)* (pp. 1-24). New York: Monthly Review Process.

- Ito, Y. (1978). "Cross cultural perspectives on the concept of an information society". In A. S. Edelstein et al (Eds.), *Information societies: Comparing the Japanese and American experiences* (pp. 253-257). Seattle: International Communication Center, School of Communications, University of Washington.
- Kling, R. (1999). Can the "next generation Internet" effectively support "ordinary citizens"? *The Information Society*, 15, 57-63.
- Kling, R. (2000). Learning about information technologies and social change: The contribution of social informatics. *The Information Society*, 16, 217-232.
- Kraemer, K. L., & Dedrick, J. (1996). IT and economic development: International competitiveness. In W. H. Dutton (Ed.), *Information and communication technologies: Visions and realities* (pp. 319-334). Oxford: Oxford University Press.
- Kraft, P. (1979). The industrialization of computer programming: From programming to "software production". In A. Zimbalist (Ed.), *Case studies on the labor process* (pp. 1-17). New York: Monthly Review Press.
- Kuhns, W. (1971). *The post-industrial prophets: Interpretation of technology*. New York: Weybright and Talley.
- Lash, S., & Urry, J. (1987). *The end of organized capitalism*. UK: Polity Press.
Chapter 1 (introduction), Chapter 6 (The service class), and Chapter 9 (Postmodern culture and disorganized capitalism).
- Lash, S. (2002). *Critique of information*. London: Sage
- Leys, C. (1996). *The rise and fall of development theory*. London: James Currey.
Chapter 1 (The rise and fall of development theory)
- Lyon, D. (1988). *The information society: Issues and illusions*. UK: Polity Press.
- Machlup, F. (1962). *The production and distribution of knowledge in the United States*. Princeton: Princeton University Press.
Chapter I (introduction), Chapter II (Types of knowledge and of knowledge production), and Chapter III (knowledge-producing industries and occupations).
- Mackay, H. (1995). Theorizing the IT/society relationship. In N. Heap et al (Eds.), *Information technology and society: A reader* (pp. 41-53). London: Sage.
- MacKenzie, D., & Wajcman, J. (1999). Introductory essay: The social shaping of technology. In D. MacKenzie & J. Wajcman (Eds.), *The social shaping of technology*, second ed. (pp. 3-27). Buckingham: Open University Press.

- Mansell, R. (1996a). Communication by design? In R. Mansell, & R. Silverstone (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 15-43). Oxford: Oxford University Press.
- Mansell, R., & Wehn, U. (1998). *Knowledge societies: Information technology for sustainable development*. Oxford: Oxford University Press.
- Masuda, Y. (1980). *The information society as post-industrial society*. Tokyo: Institute for the Information Society (IIS).
- Menzies, H. (1996). *Whose brave new world? The information highway and the new economy*. Toronto: Between the Lines.
- Merkle, J. (1980). *Management and ideology*. Berkeley: University of California Press. Chapter 1 (The origins of the Taylor system).
- Miles, I. (1996). The information society: Competing perspectives on the social and economic implications of information and communication technologies. In William H. Dutton (Ed.), *Information and communication technologies: Visions and realities* (pp. 37-52). Oxford: Oxford University Press.
- Morris-Suzuki, T. (1997). Capitalism in the computer age and afterword. In J. Davis *et al* (Eds.), *Cutting edge: Technology, information capitalism, and social revolution* (pp. 57-72). London: Verso.
- Mosco, V. (1988). Introduction: Information in the pay-per society. In V. Mosco, and J. Wasko (Eds.), *The political economy of information* (pp. 3-26). Wisconsin: The University of Wisconsin Press.
- Mosco, V. (2004). *The digital sublime: Power, myth, and cyberspace*. Massachusetts: MIT Press.
- Mulgan, G. J. (1991). *Communication and control: Networks and the new economies of communication*. New York: The Guilford Press. Introduction and Chapter 1 (Networks and post-industrial societies).
- Noble, D. F. (1978). Social choice in machine design: The case of automatically controlled machine tools and a challenge for labor. *Politics & Society*, 8(3-4), 313-347.
- Noble, D. (1989). High Tech Skills: The corporate assaults on the hearts and minds of union workers. In D. Hams (Ed.), *It's our own knowledge: Labor public education and skills training* (pp. 59-79). Toronto: Garamond.
- Nora, S. & Minc, A. (1981). *The computerization of society*. Cambridge: The MIT Press.
- Patterson, R., & Wilson, E. J. (2000). New IT and social inequality: Resetting the research and policy agenda. *The Information Society*, 16, 77-86.

- Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artefacts: or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science*, 14(3), 399-441.
- Porat, M. U. (1977). *The information economy: Definition and measurement*. Washington, D.C.: U.S. Department of Commerce.
Chapter 1, 2, & 3.
- Poster, M. (1990). *The mode of information: Poststructuralism and social context*. Chicago: The University of Chicago Press.
- Rich, B. (1994). *Mortgaging the earth: The World Bank, environmental impoverishment, and the crisis of development*. Boston: Beacon Press.
Chapter 8: From Descartes to Chico Mendes: A brief history of modernity as development.
- Sachs, W. (1992). Introduction. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (pp. 1-5). London: Zed Books.
- Schement, J. R., & Curtis, T. (1995). *Tendencies and tensions of the information age: The production and distribution of information in the United States*. New Brunswick: Transaction Publishers.
Introduction, Chapter 1 (the new industrial society), chapter 2 (interconnectedness), chapter 3 (information work), and chapter 7 (the information society as a state of mind).
- Schiller, D. (1988). How to think about information. In V. Mosco, and J. Wasko (Eds.), *The political economy of information* (pp. 27-43). Wisconsin: The University of Wisconsin Press.
- Schiller, D. (1997). The information commodity: A preliminary view. In J. Davis *et al* (Eds.), *Cutting edge: Technology, information capitalism, and social revolution* (pp. 103-120). London: Verso.
- Sein, M. K., & Harindranath, G. (2004). Conceptualizing the ICT artifact: Toward understanding the role of ICT in national development. *The Information Society*, 20, 15-24.
- Senker, P. (1995). Technological change and the future of work. In N. Heap *et al* (Eds.), *Information technology and society: A reader* (pp. 135-148). London: Sage.
- Silverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Mansell, & R. Silverstone (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 44-74). Oxford: Oxford University Press.
- Silverstone, R., & Mansell, R. (1996). The politics of information and communication technologies. In R. Mansell, & R. Silverstone (Eds.), *Communication by design: The politics of*

information and communication technologies (pp. 213-228). Oxford: Oxford University Press.

Simpson, L. (2004). Community informatics and sustainability: Why social capital matters. Retrieved December 10, 2004 from the www.ciresearch.net/conferences/viewabstract.php?id=109&cf=4

Sussman, G. (1997). *Communication, technology, and politics in the information age*. Thousand Oaks: Sage.

Ray, C. A. (1989). Skill reconsidered: The deskilling and reskilling of managers. *Work and Occupations*, 16 (1), 65-79.

Robin, K., & Webster, F. (1988). Cybernetic capitalism: Information technology and everyday life. In V. Mosco, and J. Wasko (Eds.), *The political economy of information* (pp. 44-75). Wisconsin: The University of Wisconsin Press.

Thomas, R. (1995). Access and inequality. In N. Heap *et al* (Eds.), *Information technology and society: A reader* (pp. 90-100). London: Sage.

Van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19, 315-326.

Wajcman, J. (2000). Reflections on gender and technology studies: In what state is the art? *Social Studies of Science*, 30(3), 447-64.

Warschauer, M. (2003). Dissecting the "digital divide": A case study in Egypt. *The Information Society*, 19, 297-304.

Webster, F., & Robins, K. (1986). *Information Technology: A Luddite analysis*. Norwood, New Jersey: Ablex Publishing Corporation.

Webster, F. (1995). *Theories of the information society*. London: Routledge.

William, R., & Edge, D. (1996). The social shaping of technology. In W. H. Dutton (Ed.), *Information and communication technologies: Visions and realities* (pp. 53-68). Oxford: Oxford University Press.

Winseck, D. (2002). Illusions of perfect information and fantasies of control in the information society. *New Media & Society*, 4(1), 93-122.

Winner, L. (1986). *The whale and the reactor: A search for limits in an age of high technology*. Chicago: The University of Chicago Press.
Part I (A philosophy of technology) and part II (Technology: Reform and revolution).

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27(2), 151-208.

Woolcock, M. (2001). The place of social capital in understanding social and economic outcomes. *isuma: Canadian Journal of Policy Research*, 2(1), 11-17

Yearley, S. (1988). *Science, technology, and social change*. London: Unwin Hyman.
Chapter 4 (science, technology, and economic success) and Chapter 6 (technology, science, and development)

Zappacosta, M. (2001). Information technologies for rural development: Between promises and mirages. *Info*, 3(6), 521-534.