INFORMATION AND COMUNICATION TECHNOLOGY AND SOCIAL JUSTICE: THE DIGITAL DEVIDE

di Laura Teodori e J. Paul Robinson

Human rights are tightly linked to the possibility of interpersonal communication among people and populations (1). Indeed, communication is a basic human right itself as affirmed in the Universal Declaration of Human Rights (2) which states:

Art 19: *"Everyone has the right to freedom of opinion and expression: this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."*

Art 27: "*Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits."*

It follows from this that it is the responsibility of a society to establish measures to guarantee the achievement of the rights set forth in the Declaration as also stated in Article 28:

"Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized."

Modern societies are heavily depending upon communication, knowledge and information and communication technologies (ICTs) are essential for the production and dissemination of knowledge within a modern societal structure. Societies have increasingly begun to stress the role of ICT as an enabler of social, economic and cultural development. ICTs improve the dialogue between people and groups.

WHAT IS ICT?

Information and Communication Technologies ICTs is a general term which refers to a variety of information-handling tools, goods, applications and services used to produce, store, process, distribute and exchange information (3). They include the older ICTs such as radio, television, telephone, electricity lines etc and the new ICTs such as computers, satellite and wireless technology. ICT also refers to the Internet and Internet-based tools such as Usenet conferences, news groups, text messaging and the World Wide Web. As technological innovations evolve, ICT also involve more hybrid tools, including tele and video-conferencing, e-mail devices, and other wireless systems. These different tools are interactive giving rise to the "networked world" accelerating the globalization. Technologically, distance and time are becoming almost irrelevant and the world is becoming a global village.

The Internet is the fastest growing component of ICT. In developed countries, it has already become the new mass medium, overtaking radio and television by far. E-mail has changed the way of communicating between people, in the 21st century written letters and eventually faxes may become extinct. No longer will be the record be maintained on paper.

Several aspects of the distribution of ICTs have been highlighted as relevant benefits that contribute to a country's development in various aspects such as:

- health information which is becoming more readily available on-line than off-line; health services can improve care through the Internet. Individuals are empowered by using the web for their wellbeing;
- economic growth and development: information regarding financial investment opportunities, electronic links between local businesses and consumers, employment opportunities and bank transactions, on line shopping;
- general education: access to journals, greater availability of reference materials attendance at electronic conferences, access to interactive textbooks, access to experimental software, enhanced library services, and many more. Tele-learning and education, distance learning, academic and knowledge-based conversations, such as are facilitated by on-line discussion groups.;
- civil information such as legislation and information about government services, local government regulations and services are increasingly accessible on-line.

Political participation, idea shearing and contribution to political debates blogs and online news services:

- communication with friends, and establishing new relationships;
- entertainment.

Thus industry, economics, governance and society are all increasingly interdependent, while simultaneously being dependent upon information technology. In fact, national infrastructure: electricity, gas, water, sewage, rail, road and air transport as well as telecommunications are all dependent on each other and fundamentally upon the telecommunication infrastructure.

From the above perspective we can state that ICT undoubtedly contributes to the advancement of human kind. However, coupled with these beneficial outcomes, there are concomitant detrimental issues associated with ICT. Some of these are related to misuse of this technology for non ethical and immoral uses such as pornography, obnoxious commercial advertising, on-line predators, hacking into security information systems motivated by bravado or the desire to steal sensitive information, fraud or disruptive intrusion (4). More recently, e-mail spam has resulting in huge costs to government and industry (5).

One important impact of the ICT age is the production of vast quantities of electronic hardware waste (6). Much of this material is dumped by industrial nations in developing countries creating an environmental concern. Electronic devices can contain up to 1000 toxic substances, such as lead, chromium, rechargeable batteries and a variety of plastic additives (7)(8)

Inappropriate dumping or recycling contaminates both ecosystems and humans. The waste-flow represents real global phenomena as consumption and production systems move resources, energy, environmental and health effects around the world. Computers are often designed in the US, Europe, and Japan but manufactured in countries like China, Taiwan and Singapore. They are produced with materials extracted from Africa and Australia and used almost everywhere in the world but sent for recycling and disposal, to China, India, and Pakistan and other low income countries (9). Global attention is focused on these critical issues and pertains to the dual use discussion. However there is a further perspective in the field of the dual use dilemma: the problem related to the uneven distribution of the ICTs and the unequal access to their benefits (10). Even non-use can be considered as misuse because lacking the advantages of ICTs produces detrimental effects. This paper will focus its attention on this new perspective.

Indeed, one of the most serious moral problems associated with the new ICTS is the issue of justice in their distribution and in the distribution of the benefits of their outcomes (8) This concern was first raised at the end of the twentieth century (11). The phenomenon of inequalities in the distribution of ICTs - that some people have much greater and easier access to ICTs than others – has been termed the "digital divide" (12). It refers to a cleavage between those who can benefit from using ICT and *"that segment of the population that cannot"* (13)(14)(15)(16).

There are several reasons for this divide: the cost of hardware (computers, modems, printers etc.) has been high and thus accessible only to those who can afford it. This has contributed significantly to preventing the disadvantaged from participating in the information revolution. Another force has been the actual or perceived high skill level required to operate advanced software which inhibits access by those less educated. In fact, ICT skills are largely based on literacy. Thus, the illiterate population is frequently excluded from the emerging knowledge societies. This affects mostly women, since the global illiteracy rate for women is higher than for men. Other groups, however, suffer from ICT marginalization. A recent US study by the National Telecommunications and Information Administration revealed that while access to computers, modems and online connectivity increased throughout the United States during the last decades, the gap between the rich (white and non-Hispanic) and the disadvantaged city populations widened considerably (17). Analysts see stubborn racial disparities in technological access and participation in the high-tech economy as a threat of conflict. Equalizing access to technology and training has become *"the new frontier of civil rights."*

Another fundamental issue in the use of ICT is the language and prevailing use of icons. The language of the Internet is almost entirely English. This language is spoken by only ten per cent of the world's population. Very interestingly, the "icons" in internet languages are heavily driven by western culture. For examples the arrow icon might have no significance in some other culture. The benefits of the ICTs are therefore mostly available to the English-speaking, industrial-

ized nations resulting in the less-developed countries potentially falling behind rapidly as technology advances.

The "Information Revolution" can exclude large parts of society and create a further division between the *"haves"* and the "have-nots". A recent study measured the digital opportunity for America's children and young adults by analysing four key areas to see whether and how ICT is helping normal and disabled children and young adults: 1) improve educational achievement; 2) lead healthier lives; 3) increase economic opportunity; 4) participate in their communities. The study showed that ICT is changing the way young people access opportunities but also revealed disturbing disparities that have resulted in an "opportunity gap" for millions of low-income and ethnic minorities (18).

The study supports the notion that low-income individuals and ethnic minorities are victims of the digital divide.

Analogously, Europe is facing the same problem. Despite the strong emphasis on knowledge-based societies, knowledge dissemination, digital communication as evidenced by the recently coined slogan *"Europe goes digital"*, the digital divide continues to haunt us (19). Changing and adapting to new technology is one of the main planks of the EU's Agenda, which aims to boost Europe's competitiveness (20). One of the major obstacles is the digital divide. Among member states, the study showed large differences between countries, and within countries among ages and educational levels (21)(22). The figures reported show the real face of the unequal distribution of knowledge and of the digital/technological divide. This widening gap between rich and poor countries is seen by some analysts as a division between "the West and the Rest" (23).

REFERENCES

1. William, J., McIver, Jr., Birdsall, W.F., & Rasmussen, M. (2003). The Internet and the right to communicate. EURICOM 2003 Conference, Padua & Venice, Italy, 3-7 May. Accessed October 2007 at: http://www.firstmonday.org/issues/issue8_12/mciver/#author
2. Universal Declaration of Human Right: full text. Accessed October 2007 at: http://www.un.org/Overview/rights.html
3. What is ICT? Accessed October 2007 at: http://www.kented.org.uk/ngfl/ict/definition.htm
4. Cyber crime and misuse of ICT. Accessed October 2007 at: http://www.unesco.org/cgi-bin/webworld/portal_observatory/cgi/page.cgi?g=Enabling_Environment%2FCyberCrime_and_Misuse_of_ICT%2Findex.shtml;d=1
5. Nelson, M. (2003). Spam Control: Problems & Opportunities. Accessed October 2007 at: http://www.ferris.com/2003/01/24/spam-control-problems-amp-opportunities/
6. Hilty, L. (2005). Electronic waste, an emerging risk. Environmental impact assessment review. 25, 431-435.
7. Inside the digital dump (2007). Accessed October 2007 at: http://www.foreignpolicy.com/story/cms.php?story_id=3807&page=0
8. Teller, M. (2006) Sustainable Metals Management Recycling of Electronic Waste Material. 563-576 Springer Netherland
9. Iles, A. T. (2004) Mapping Environmental Justice in Technology Flows: Computer Waste Impacts in Asia. Global Environmental Politic. 4, 76-107.
10. Iske, S.,Klein, A., & Kutscher, N. (2005) Differences in Internet Usages - Social Inequality and Informal Education. Social Work & Society, 3, 215-223.
11. Robinson, J.P. (2003) Digital Divides: Past, Present and Future IT&SOCIETY 1 (5) . Accessed October 2007 at: http://www.stanford.edu/group/siqss/itandsociety/v01i05/v01i05_intro.pdf

12. http://www.digitaldivide.org/dd/digitaldivide.html. Accessed October 2007.

13. Selwyn, N. Defining the digital divide: developing a theoretical understanding of inequalities in the information age. Accessed October 2007 at: http://www.cf.ac.uk/socsi/ict/definingdigitaldivide.pdf

14. Norris, P. (2001). Digital divide: Civic engagement, information poverty, and the Internet worldwide. Cambridge, NY: Cambridge University Press.

15. Van Dijk, J. (2004). The Deepening Divide: Inequality in the Information Society. Thousand Oaks, London, New Delhi: Sage.

16. US Department of Commerce (1999). Falling Through the Net: Defining the Digital Divide. Accessed October 2007 at: http://www.ntia.doc.gov/ntiahome/fttn99

17. USA today. (2006). Digitial divide still separates white and minority students. Accessed October 2007 at: http://www.usatoday.com/tech/news/2006-09-05-digital-divide_x.htm

18. Lazarus, W., Wainer, A., & Lipper, L. (2005). Measuring Digital Opportunity for America's Children: Where We Stand and Where We Go From Here. Accessed October 2007 at: http://cjtc.ucsc.edu/docs/dd_highlights.pdf

19. Europe's information society portal. Accessed October 2007 at: http://ec.europa.eu/information_society/index_en.htm

20. http://ec.europa.eu/europe2020/index_en.htm

21. Demunter, C. (2005) The Digital Divide in Europe.38/2007. Accessed October 2007 at: http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-NP-05-038/EN/KS-NP-05-038-EN.PDF

22. Eurostat News Release. (2006) , 83/2006. Accessed October 2007 at: http://epp.eurostat.cec.eu.int/pls/portal/docs/PAGE/PGP_PRD_CAT_PREREL/PGE_CAT_PREREL_YEAR_2006/PGE_CAT_PREREL_YEAR_2006_MONTH_06/4-20062006-EN-AP.PDF

23. Maddison, A. (2003) The West and the Rest in the International Economic Order. Accessed October 2007 at: http://www.oecdobserver.org/news/fullstory.php/aid/884/The_West_and_the_Rest_in_the_International_Economic_Order.html.

LAURA TEODORI

Laura Deodori è primo ricercatore presso BAS BIOTEC-MED ENEA-Casaccia. Professore a Contratto presso la Scuola di Specializzazione di Oncologia- Facoltà di Medicina e Chirurgia Università degli Studi di Roma" La Sapienza. E' Presidente del Membership Committee dell'International Society for the Advancement of Cytometry-ISAC. www.isac-net.org Bethesda, MD USA LT, Dipartimento di Biotecnologie, Agroindustria e Protezione della Salute, ENEA

Contatti:

E-mail: Teodori@casaccia.enea.it *http://profiles.within3.com/teodori*

Ufficio : +39 06 30484930 *Mobile (servizio): +39 3208528534*

J.PAUL ROBINSON

Purdue University Cytometry Laboratories

Bindley Bioscience Center, Purdue University, West Lafayette, IN USA