## Information, Communication & Society

## EDITORIAL COMMENT

Robert M. Bichler [a]; Gunilla Bradley; Wolfgang Hofkirchner [b]
[a] German Department, Shanghai International Studies University, Shanghai, P.R. China [b] Institute for Design and Technology Assessment, Vienna, Austria

## PLEASE SCROLL DOWN FOR ARTICLE

# Robert M. Bichler, Gunilla Bradley & Wolfgang Hofkirchner

## EDITORIAL COMMENT
## Sustainable development and ICTs

We are proud to present the first issue of *iCS* in 2010.

Why is a special issue on the relation between Information and Communication Technologies (ICTs) and the notion of sustainable development important?

Contemporary societies are characterized on the one hand by developments in science and technology, which have improved individual living standards, and on the other hand by pressing ecological, political, economic and cultural problems. Additionally, the development, use and ephemerality of technologies bear inherent risks of side effects, e.g. resulting waste, pollution, health risks, and other unforeseen, undesired destructive social and societal changes. The question of how to solve current societal problems on a global scale in a sustainable manner is therefore put more and more on the agenda of the scientific as well as the public debate.

In 1987, the World Commission on Environment and Development (WCED) published the so-called 'Brundtland Report', named after the then Prime Minister of Norway. WCED was a follow-up of the first United Nations World Conference on the Environment in Stockholm in 1972. The report gave much attention to the challenges of overcoming poverty and meeting basic needs, as well as integrating environmental aspects into economic decision-making processes. Sustainable development was defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987, p. 43).

Sustainability is often defined by entailing an economic, a social, and an ecological dimension. In 'Agenda 21' at the Rio 'Earth Summit' (United Nations Conference on Environment and Development 1992), four mutually independent dimensions of sustainability were stated and combined to a more comprehensive approach: ecological, social, economic and cultural. Ismail Serageldin, later vice-president of the World Bank, identified in his *triangle of sustainability* economic, social and ecological dimensions (Serageldin 1995, p. 17). Thus it has been very important and strategic to bring the discussion on sustainability from purely ecological aspects further towards a more integrative concept. The European Union, the United Nations and other

transnational organizations nowadays concordantly identify an ecological, an economic, a social, and also an institutional dimension of sustainability.

The term 'sustainability' has been around for a long time and has been criticized as worn-out in certain disciplines. However it is rare that sustainability is related to technology, and more particularly to ICT. This special issue is dedicated to the question of how ICTs, which are fundamentally changing the daily lives of individuals as well as the overall functioning of organizations and societies, should be designed and used to contribute to sustainable development.

To obtain papers for this special issue on 'Sustainable Development and ICTs', we distributed a thematic call via various mailing lists and websites across disciplines. We used a three-stage refereeing process to select the seven papers that appear in the issue at hand. The collected articles cover a wide range of topics related to ICTs and sustainable development, ranging from theoretical to empirical and practical contributions. We are very grateful to the reviewers for their critical comments and valuable inputs. We also wish to thank the authors for their contributions and for meeting the schedule. Last but not least our special thanks go to Brian Loader and Sarah Shrive-Morrison for their positive responses to and support of this special issue.

Lorenz M. Hilty and Thomas F. Ruddy discuss in their paper the connection between sustainable development and ICTs in a natural science context. They introduce their *sustainability dilemma*, which derives from the definition given in the 'Brundtland Report', and based on that, they critically examine the multidimensional concept of sustainable development. They argue that ICTs can support sustainable development only if they are applied as enablers of dematerialized production and consumption processes. Therefore economic incentives must be provided in order to change behaviours and to trigger innovations. The authors conclude with a list of research questions, especially focusing on psychosocial conditions, which appear to them as central for future social science research on consumption.

In contrast, Christian Fuchs argues in the second paper of this special issue that wealth for all human beings can only be achieved by fostering sustainability of the ecological system, the technological system, the economic system, the political system and the cultural system of society. Fuchs introduces a metatheory for defining the sustainable information society and providing arguments on which qualities such a society should fulfil. Based on a distinction between base and superstructure, he identifies four different theoretical approaches – reductionistic, holistic, dualistic and dialectical worldviews – to defining the sustainable information society. He contends that a dialectical approach, which is characterized by the notions of participation and cooperation, is needed to realize the potentials ICTs theoretically offer for sustainable development and hence can contribute to societal well-being.

The next paper, entitled 'Sustainability ICT visions and their embedding in technology construction' by Oana Mitrea, Matthias Werner and Hajo Greif, is

the first empirically oriented one in this issue. Based on an empirical study carried out in Carinthian companies, the authors analyse the role of design, system and software engineers in the technology construction process. Their aim is to find out how engineers and software developers view the link between the sustainability theme and their development activities and thus the emanating opportunities and limits. They conclude that the study particularly highlights the importance of the social dimension of ICTs for sustainable development, e.g. to ensure social inclusion, to enhance interpersonal cooperation and to foster social and political participation, for the hardware and software IT developers.

Christina Mörtberg, Dagny Stuedahl and Sara Alander focus in their contribution on the cultural dimensions of sustainability, which includes for them developing, renewing and maintaining human cultures that create positive, enduring relationships with other people and the world. They interpret data which were collected after the implementation of an e-commerce application in the meal production of Swedish public school kitchens. Like Fuchs, the authors pay special attention to participation and participatory design, which they argue to be an enabler to involve employees in design and implementation of information systems. Due to the absence of such participatory design principles they identify enormous shortcomings in the design process. They conclude that this e-commerce application has actually increased complexity, instead of making daily routines easier and more flexible.

The last of the empirical research oriented contributions by Yanuar Nugroho examines the role of the Internet for Indonesian non-governmental organizations (NGOs). By applying a combination of quantitative and qualitative research methods the author draws a detailed picture of Indonesian NGOs dealing with rural development issues and their strategies concerning the use of the Internet to achieve their goals. The findings suggest that the Internet on the one hand supports the internal management of the organization, and on the other hand, contributes to the widening of organizational perspectives and the expansion of organizational networks. Hence, Nugroho stresses that the use of the Internet by NGOs in Indonesia has an impact on promoting sustainable development within rural sector reforms. Nonetheless, the author concludes that direct (person-to-person) engagement and interaction with the beneficiaries is irreplaceable and that a lot of activities carried out by Indonesian NGOs are located in the offline world.

In their practically orientated article, Gaetano Aurelio Lanzarone and Antonella Zanzi report on an ongoing research project in Italy. The goal of the so-called MICE (Monitoring Interactively the Consumption of Energy) project is to provide end users with direct control over gas and water consumption, along with self-assessment parameters related to their utilization behaviour, by providing a continuous exchange of information between distributor, supplier and consumers. With the help of smart meters, better quality in the supply of

natural resources should be realized and consumers' awareness of their consumption behaviours should be raised in order to protect natural resources and to save costs. The authors conclude with general remarks on smart meters derived from their project experiences.

The last paper in this collection is a workshop report by TarlaRai Peterson, Rasmus Larsen, Stina Powell and Nadarajah Sriskandarajah. The workshop was held in Sweden and aimed at bringing together researchers and professionals from different contexts who share interests in issues related to ICTs and environmental management. The idea was to create a platform for discussing and formulating project and research ideas, as well as raising awareness of existing collaborations and laying the basis for new partnerships to evolve. *Open Space Technology* was applied to organize the workshop. The participants came from different research fields such as informatics, hydrology, health and nutrition, data modelling, rural development, natural resource management, environmental management and collaborative learning. The paper gives an overview of the key issues discussed during the workshop and on planned follow-up activities.

## References

Serageldin, I. (1995) 'The human face of the urban environment', in *Proceedings of the Second Annual World Bank Conference on Environmentally Sustainable Development: The Human Face of the Urban Environment*, eds I. Serageldin, M.A. Cohen & K.C. Sivaramakrishnan, World Bank, Washington, DC, pp. 16–20.

United Nations Conference on Environment and Development (1992) 'Agenda 21', Adopted at the United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3–14 June 1992.

World Commission on Environment and Development (WCED) (1987) *Our Common Future*, Oxford University Press, Oxford.

**Robert M. Bichler** is currently a lecturer at the Shanghai International Studies University (SISU) and a member of the Unified Theory of Information (UTI) Research Group – Association for the Advancement of Information Sciences. Previously he was a research fellow and lecturer at the ICT&S Center at the University of Salzburg. *Address*: Shanghai International Studies University, German Department, 550 Da Lian Road (W), Shanghai 200083, P.R. China. [email: robert.bichler@uti.at]

**Gunilla Bradley** is Professor Emerita in Informatics at the Royal Institute of Technology (KTH) – School of ICT. She has served as Professor in Informatics at Umeå University and Mid Sweden University, Visiting Professor at Stanford University, and Guest Professor at Salzburg University. She has authored

several books; her latest is entitled *Social and Community Informatics – Humans on the Net* (Routledge, 2006). In 1997 Gunilla Bradley received the Namur Award from the International Federation for Information Processing (IFIP) for her pioneering research to increase the social awareness of the impact of ICT. She chairs the annual International Association for Development of the Information Society (IADIS) conference on 'ICT, Society and Human Beings'. [email: gbradley@kth.se]

**Wolfgang Hofkirchner** is consecutively Visiting Professor at the University of León, Spain, supporting the project 'BITrum' on information concepts and finalizing a book on the Unified Theory of Information, and Visiting Professor at the Open University of Catalonia, Barcelona, where he stays at the Interdisciplinary Internet Institute (IN3), organizing the annual meeting of the 'ICTs and Society Network', and working on a book about information society theory. He is editor of *tripleC*, an open access journal for the Global Sustainable Information Society, head of the Unified Theory of Information Research Group and director of the Bertalanffy Center for the Study of Systems Science. *Address*: Institute for Design and Technology Assessment, Favoritenstraße 9/E187, 1040 Vienna, Austria. [email: wolfgang.hofkirchner@tuwien.ac.at]