Sustainable Information Society

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INTRODUCTION

As a development goal, a sustainable information society is emerging at present, with the aims of sustainability and an information society as its converging elements. This article introduces the conceptual elements of sustainability and the information society, while bringing to the surface underlying normative issues. Further, a series of opportunities is presented on how to develop towards such a promising approach. Finally, examples of using information and communication technologies (ICTs) from the 'Memorandum Sustainable Information Society' are discussed. That publication was recently released by a working group of the German Society for Informatics. The memorandum provides a valuable source of the role modern ICT is playing on the road to a forward-looking society which is based on increasing use of ICT on the one hand, while at the same time it meets the fundamental sustainability criteria of human, social, and ecological comparability on the other hand.

SUSTAINABILITY: FROM AN ENVIRONMENTAL AND DEVELOPMENT POLICY TERM TO THE GOAL FOR A LONG-TERM LIVEABLE FUTURE

Sustainable development has its roots in environmental and development policy. As such, sustainable development mirrors the efforts of the international community to meet the recent social, economic, and environmental challenges we are facing today, for example, among others, population development, food, health protection, combating poverty, and global environmental problems (Jorissen et al., 1999).

Although the idea and concept had a number of predecessors in the 1970s (Harborth, 1993), the term "sustainable development" first became popular in the wake of the so-called "Brundtland report" of the World Commission for Environment and Development in Stockholm in 1987 (Hauff, 1987). This conference was initiated under the banner of the United Nations (UN) and guided by the Norwegian prime minister Gro Harlem Brundtland. International leading experts prepared a comprehensive program of recommendations for the above mentioned global problems. The "Brundtland report" was a turning point of the environment and development policy at that time, in that the assumption of industrialization in developing countries seemed no longer tenable without a profound rethink of the lifestyles and consumption levels in industrialized countries.

The "Brundtland report" created the foundation for the current understanding of sustainable development. In a nutshell, sustainable development aims to create economic living conditions that enable all the Earth's population to satisfy their needs today, without compromising the ability of future generations to satisfy theirs. This brings two concepts of justice into play (Eckardt, 2005): firstly, *intra*generational responsibility concerning all humans alive today, and secondly, *inter*generational responsibility for the relationship between today's and future generations. Sustainable development must be regarded as a normative concept in the sense that it reposes on the two ideas of justice mentioned above: though there is no formulation of an explicit goal, sustainable development promotes a vision or a "regulative idea" in the sense of Immanuel Kant, on how all human beings could lead a decent life today and in the future. Furthermore, it discusses the minimum conditions that *should* be respected for this aim.

Sustainable development was included in the United Nations' action program for the 21st century, the so-called "Agenda 21," at the Conference for Environment and Development 1992 in Rio de Janeiro to serve as an orientation for subsequent measures regarding social and economic aspects such as population dynamics, reduction of poverty, health preservation, conservation and management of natural resources, and stakeholder dialogues. Since then, sustainable development is regarded as the unifying aim for a long-term globally livable future. The Summit for Sustainable Develop-

ment at Johannesburg 2002, the "Rio+10 Conference," confirmed the global standing of the aim of sustainable development.

Sustainable development does contain a *regulatory* dimension as well: any decision making at local, regional, national, or global levels must be implemented in such a way that any costs are not borne by uninvolved parties, future generations, or nature. In other words, the three criteria of environmental integrity, social justice, and economic quality should always be respected (Zwierlein & Isenmann, 1995), and by all social actors, be it individual persons as well as groups or institutions (e.g., families, universities, companies, or countries). This regulative idea underscores the processual character of sustainable development, that is to say, providing guidance, but not an explicit goal.

In Germany, the roots of the concept of sustainable development are believed to come from ideas of 18th century forest management, whereas the concept's etymological origins can be traced back much further, to the 12th century (Grober, 2002). Two-hundred-and-fifty years ago, revenues of forest owners collapsed when more and more forests were cleared. This led to the insight of only cutting as many trees in the future as would be newly planted. Thus, by respecting an economic principle of conservation of capital, forest revenues were stabilized for long-term benefit.

Not just the concept of sustainable development, but also its current interpretations have its roots in forest management (Ott & Döring, 2004). *Strong* sustainability stipulates living solely off the interest of natural capital. The latter must be preserved in its total amount, non-renewable resources should not be utilized and renewables only to the extent of their regeneration rates. On the other hand, adherents of *weak* sustainability want to keep constant the sum of natural and human capital only, allowing therefore substitution of natural by human capital.

THE TWO GLOBAL TRENDS OF SUSTAINABILITY AND INFORMATION SOCIETY

The development towards an information society is the second global trend influencing our modern industrial society in its combination of technical progress, economic growth, and social change (Müller-Merbach, 1998, p. 6):

- *Technical progress* is marked by innovations, especially in information and communication technologies. Digitalizing, miniaturizing, development of user interfaces, and system integration progress rapidly and lead to the amalgamation of computer technology, telecommunications, consumer electronics, and new media. The resulting applications become examples of "pervasive computing" (its consequences are discussed in Hilty, Som, & Köhler, 2004; Hilty et al., 2005a).
- The industrial sectors of ICT and multimedia, among them chip manufacturers, hardware and software developers, and information service providers, can be counted among the biggest growth sectors worldwide. They are an important part of future *economic growth*.
- Use of modern ICT and information services lead not only to changes in the way work is organized and carried out, they exert a strong influence on social models of consumption, individual lifestyles, leisure pursuits, and accelerate *social change*.

The UN world summits on the information society, in Geneva in 2003 and in Tunis in 2005, can be taken as proof of the strong political interest in this phenomenon touching the entire human society.

Rapid ICT development contributes to technical progress in many domains. ICTs facilitate professional work and can render daily life more pleasant in many ways. Further, ICTs can provide unique opportunities for sustainable development (cf. resources of the Technical Committee on Computer Science in Environmental Protection, 2006; further: Hilty, Seifert, & Treibert, 2005b; Waage, Shah, & Girshick, 2003; Rautenstrauch & Patig, 2001), for example, helping to dematerialize economic processes and therefore reduce material and energy throughput (Teitscheid, 2002).

However, increasing use of ICTs does not automatically contribute towards sustainable development (Schauer, 2000, 2003). Its rapid progress and ubiquitous use create new problems for individuals, society, and nature. Thus, we need an ethical understanding of its promises and risks on the one hand and a political implication on the other hand in order to render our developing information society (Woesler, 2005) compatible with the aim of sustainability.

Electronic waste, high consumption of resources for the manufacturing of PCs, and the consumption of