



Chapter IX

Virtual Networking without a Backpack? Resource Consumption of Information Technologies

Justus von Geibler, Wuppertal Institute, Germany

Michael Kuhndt, Wuppertal Institute, Germany

Volker Türk, Wuppertal Institute, Germany

Abstract

This chapter concentrates on the environmental impacts of the increasing use of the Internet. It highlights that the Internet and Internet applications are far from being purely virtual, but are clearly linked to the use of natural resources. With the growth of the Internet's infrastructure there is a seemingly inevitable increase in the resource consumption for the production of electronic equipment and its electricity consumption. A number of conclusions can be made regarding the minimisation of environmental risks and maximisation of ebusiness' potential to dematerialise. The presented findings are mainly based on findings derived from research within the Digital Europe project, which was conducted as the first pan-European study of the social and environmental impacts and opportunities of e-commerce and information communication technologies. Supported by the European Commission, the project has been led by the research organisations Fondazione Eni Enrico Mattei in Italy, Forum for the Future in UK and the Wuppertal Institute in Germany.

This chapter appears in the book, *Information Systems for Sustainable Development*, edited by Lorenz M. Hilty, Ebergard K. Seifert and Rene Treibert. Copyright © 2005, Idea Group Inc. Copying or distributing in print or electronic forms without written permission of Idea Group Inc. is prohibited.

Introduction

The transition from an industrial society to a service society proceeding in many countries of the world is supported by information and communication technology (ICT) and ICT applications. The industrial society was primarily about large-scale production and distribution of goods. Within the service society, added value is increasingly generated from immaterial production factors such as information and know-how, and a large number of functional areas such as the economy, politics, legislation, culture or health depend to an increasing degree on knowledge. Adoption of this knowledge is supported by ICT. Thus ICT can be accounted as a key technology within the service society.

The diffusion of ICT within societies can be illustrated by the adoption of the Internet. Even if only experts knew the medium “Internet” at the beginning of the 90s, it became mass media in the middle of last decade. About 600 million people have gone online in the last 15 years – this is about 10% of the world population. And there are forecasts that there will be 710 million users of the Internet in the year 2004 (e.g., Cyber Atlas, 2003). On average, 81% of EU enterprises accessed the Internet in 2002, and a majority of them had their own Web site or homepage (European Commission, 2003). Even if the initial euphoria about the new technology is subsiding, every day we hear news about large ICT investments, technology innovation and new areas of ICT applications.

As ICT and ICT applications increasingly spread, so do also the ecological problems of this trend appear to become more relevant. For example, increasing Internet use is linked with increasing electricity use. However, ICT is generally not seen to be associated with significant environmental problems. In fact, the opinion predominates that new communication media are just as virtual as their contents. Sometimes it is even seen as an innovation, which would make possible a sustainable and resource-efficient way of life per se.

This chapter highlights the environmental impacts of the increasing use of the Internet. The following section provides insights into the physical elements of the ICT infrastructure with a specific focus on the Internet, and provides a classification of environmental effects caused by ICT. The subsequent sections discuss the direct and indirect effects as well as the systemic effects on the consumption of natural resources. Finally, conclusions are drawn on how to develop a more resource-efficient information society.

This book contribution is based mainly on findings derived from research within the Digital Europe project. The project was conducted as the first pan-European study of the social and environmental impacts and opportunities of e-commerce and information communication technologies. Supported by the European Commission, the project has been led by the research organisations Fondazione Eni

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/virtual-networking-without-backpack-resource/23452

Related Content

Community Forest and Rural Household Dependency in Mining Region: A Micro-Analysis in Odisha, India

Minati Sahoo (2021). *International Journal of Social Ecology and Sustainable Development* (pp. 15-27).

www.irma-international.org/article/community-forest-and-rural-household-dependency-in-mining-region/287521

Entrepreneurial Thinking in the Educational System

Ctlin Grdinaru, Sorin-George I. Tomaand Paul I. Marinescu (2018). *Value Sharing for Sustainable and Inclusive Development* (pp. 29-48).

www.irma-international.org/chapter/entrepreneurial-thinking-in-the-educational-system/192216

A Comparative Analysis of Knowledge Management Practices in Times of Crisis in the Digital Age: Evidence from an Emerging Economy

Isa Ipcioglu (2015). *International Journal of Social Ecology and Sustainable Development* (pp. 1-16).

www.irma-international.org/article/a-comparative-analysis-of-knowledge-management-practices-in-times-of-crisis-in-the-digital-age/124202

Does Green Entrepreneurship Have an Association With Sustainable Development and Its Components?: Evidence From a Country-Wise Panel Data Investigation

Ajay K. Singh, Sanjeev Kumar, Aditya Kumar Sharmaand Shivani Sinha (2022). *International Perspectives on Value Creation and Sustainability Through Social Entrepreneurship* (pp. 132-172).

www.irma-international.org/chapter/does-green-entrepreneurship-have-an-association-with-sustainable-development-and-its-components/309829

Anuvaad: A Hindi-Sanskrit-Hindi Bilingual Machine Translation System Using Rule-Based Approach

Vishu Madaanand Prateek Agrawal (2022). *International Journal of Social Ecology and Sustainable Development* (pp. 1-14).

www.irma-international.org/article/anuvaad/295088