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Pervasive Computing – A Case for the Precautionary Principle?

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Abstract

The Precautionary Principle aims to anticipate and minimize potentially serious or irreversible risks under conditions of uncertainty. It has been incorporated into many international treaties and pieces of national legislation for environmental protection and sustainable development. However the precautionary principle has not yet been applied systematically to novel Information and Communication Technologies (ICTs).

The results of EMPA's four-year research program "Sustainability in the Information Society" (www.empa.ch/sis), co-funded by the ETH board, suggest that precaution is necessary in the ICT field and show how the general principle of precaution can be put in concrete terms in the context of the information society. In particular, we advocate precautionary measures directed towards *pervasive* applications of ICTs (Pervasive Computing) because of their large potential impacts on society (Hilty et al. 2003, Som et al. 2004).

Assessing a technological vision before it has materialized makes it necessary to deal with two types of uncertainty: first, the uncertainty of how fast and to which extent the technology will be taken up and how it will be used; second, the uncertainty of causal models connecting technology-related causes with potential social, health or environmental effects. Due to these uncertainties, *quantitative* methods to evaluate expected risks are inadequate. Instead, we developed a "risk filter" that makes it possible to rank risks according to a set of *qualitative* criteria based on the Precautionary Principle and on the principle of Sustainable Development (Hilty et al. 2004).

The following potential negative impacts of Pervasive Computing on society were identified: restriction of consumers' and patients' freedom of choice, stress caused by time-rebound effects and by unreliable technology, a 'dissipation' of responsibility in computer-controlled environments, and threats to ecological sustainability caused by a new type of electronic waste (Kräuchi et al. 2005).

It is indisputable that ICT plays an necessary role in tackling the most difficult challenge facing global society today – Sustainable Development (Arnfolk et al. 2004, Hilty et al. 2005). In particular, Pervasive Computing offers great opportunities to society, but we will only be able to exploit this potential if we minimize the risks it brings about at an early stage of development.

Since RFID technology is one of the forerunners of Pervasive Computing, and as such is expected to play an important role in daily life in the near future (BSI, 2004; Kräuchi et al. 2005), it will be used as an example to illustrate our approach.

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