Basic Ethical Framework:
Guidance for Environmental Informatics towards a Sustainable Information Society

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Abstract
In this paper a basic ethical framework is presented. It provides useful guidance for environmental informatics’ contribution to design towards a sustainable information society. In more detail the framework is illustrated by a set of three essential verifications concerning human, social, and environmental acceptability. Computer scientists should consider these verifications as minimum when they take their responsibility to contribute reaching the goal of a sustainable information society. The framework is seen as pioneering effort both, in order to present a solid underpinning, and also to conceptualise ethical thinking within environmental informatics’ contribution and computer scientists’ responsibility to design towards a sustainable information society.

According to the above-mentioned purpose basic ethical aspects are situated in the centre. The tangible object of this paper is twofold while writing half-way between popular and very academic: firstly, as a larger goal, to make ethical thinking quite accessible to non-philosophers while its content is of interest to professional philosophers, and secondly, more precisely, to stimulate reflection and encourage awareness that the challenge to design towards a sustainable information society is indispensably an normative-laden question which requires reflection on ethics. Therefore a basic ethical framework is proposed by a lucid and informative way. The paper is divided into four sections:

1. Interrelations between information society and sustainability, including a mind map of information society’s characteristics as chance society and risk society.
2. Hidden ethics: Basis to design towards a sustainable information society.
3. Guidance by ethics and responsibility of environmental informatics.
4. Verifications to design towards a sustainable information society.

Keywords: Chance society; computer scientist; environmental informatics; ethics; information- and communication-technologies (ICT); information society; responsibility; risk society; sustainability.

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1 Interrelations between Information Society and Sustainability

In the first introductory section information society and sustainability are systematically linked by an integrated mind map (fig. 1). This mind map is seen simply schematic, not photorealistic. However, it proves useful to survey substantial interrelations of our industrial civilisation en route to information society on the one hand and the goal of sustainability on the other hand.

Whatever description of information society is even drawn, it is influenced by major use of ICT-products and -services, applications of ICT, information and -services etc. affecting all kinds of science, technology, business, and lifestyle. So ICT and information use are interpreted as key drivers and promoting vehicles towards information society. They represent main characteristics on which research analyses, expertises and scenarios, governmental programmes, and (multi-)national initiatives concerning information society are primarily based. However, major use of ICT and information are ambivalent and multi-faced. At societal level this ambivalence and multifaced picture can be described thoroughly by terms of chance society and risk society (Isenmann 1998, 62-68):

On the one hand major use of ICT and information enable a so-called chance society, providing various opportunities e.g. for economic growth, creating additional jobs, further societal participation in public planning and discourse processes, more efficient public administration, and smart environmental innovations by dematerialisation, avoiding traffic by telematic services, reduced energy consumption, and also other facilities in order to improve human’s working and living conditions.
On the other hand focusing just on technological progress and market forces may drive to a so-called risk society, producing negative side-effects at global level e.g. economic poverty and negative rationalisation effects, social exclusion - in particular the phenomenon of digital divide -, and environmental rebound effects. In sum these serious threats cannot be controlled easily by nationwide efforts, conventional crisis management, and business as usual because the generated risks increase disproportionately faster than solutions.

The keynote is to be aware of the ambivalence and to consider the “solution” of just using ICT and information themselves as part of the problem to reach the goal of sustainability; problematic because major use of ICT and information affect the human, social, environmental, and economic dimension of sustainability both, in positive and/or negative ways (Deutscher Bundestag 1998, 145-227). They do not automatically cause economic prosperity, social justice, environmental consistency, and human benefits. In fact, ICT and information are valuable means serving for human’s good life but their use require normative control by ethics.

The other way round the goal of sustainability seems merely to be reached both, by exploiting the huge facilities of advanced ICT and the various benefits of adequate information supply (Hilty/Ruddy 2000). The complex decision-making-processes at governmental, scientific, and business level usually require up-to-date and accurate information supply by effective ICT. Consequently there is still need for applying ICT and using information. Summed up, the contribution of major ICT and information use towards sustainability will primarily depend on the general setting which will be provided. This setting is undeniably influenced by ethics.

2 Hidden Ethics: Basis to Design towards a Sustainable Information Society

Based on the mind map outlined above (fig. 1) the second section deals with ethical basics as necessary prerequisite because both, information society and sustainability are ambiguous terms and normative-laden questions of designing future, regularly including hidden ethical assumptions i.e. of good life and justice, happiness and benevolence, virtue and responsibility as well as of technical progress, economic efficiency, social sufficiency, environmental consistency and other side-effects (Zwierlein 1998). Thus the design towards a sustainable information society cannot be defined without clarifying usually hidden ethics and underlying moral concepts.

Although there are a lot of contributions concerning information society carried out well, it is quite difficult to predict what outline figure or exact shape a sustainable information society will take. Designing the future cannot fully been anticipated because it represents a generally open and rather indetermined process of development. According to Müller-Merbach (1988), every development of industrial systems is influenced and can only be understood thoroughly by the interdependence of
technological progress, economic growth, and social change. Any of these three forces influences the two others; metaphorically, they stick together like strands in a rope. Concerning the normative-laden development towards a sustainable information society, there is rather another important fourth force: that is ethics. The importance of ethics can be pointed out a little more precisely by two essential reasons:

The first reason is that different interpretations of basic ethical assumptions and moral concepts typically imply discrete consequences and strategies because undeniably they have influence e.g. on private beliefs, personal preferences, application of scientific instruments, cultural motivation, economic interests, human needs and societally desirable objects of addressed and/or participating actors. The second reason is that - according to Immanuel Kant - every action covers in itself an ethical component. It is - so to speak definitely - impossible to act within an “ethical no-man’s-land”. Moral action represents a genuine component of the non-separable totality of action in practice (Müller-Merbach 1989). Thus ethics is already internal, always implicit, and usually inherent. This is why ethics looks like a pivot, representing a fundamental basis for designing towards a sustainable information society.

The basis of usually hidden ethics should be uncovered because it defines the overall object of a sustainable information society, its interpretation as attainable goal, the transmission as desirable vision, and, last but not least, probably ends and means which have to be taken to reach the goal. The process of uncovering encloses an analysis of the underlying interpretation of ethics and all complexities to specify ethical dimensions within the converging fields of information society and sustainability towards a sustainable information society.

All addressed implications have to be made transparent, considered seriously, and combined consistently. Therefore helpful guidance is urgently needed. Except for few contributions (Radermacher/van Dijk/Pestel 2000; GIS Working Group ISSD) the important ethical assumptions to design towards a sustainable information society are neglected completely. Surprisingly the term “ethics” resp. basic moral principles - which are essential for the goal of a sustainable information society - have not even been put on the European Commission’s “Information Society Website” (2001). As a result the underlying ethical impacts often remain unquestioned, just transmitted like a Trojan Horse. Frequently they are still discussed on a secondary level or considered in such a limited way that they have only minor effects.

According to the introductory purpose of this paper, ethics can be described appropriately as comprehensive theory of practice containing two related realms (Zwierlein/Isenmann 1995, 37-42; Spaemann 1989): The one realm of ethics is dealing with the question of good life of individual humans. Concerning the end, ethics aims to a theory of happiness, attainable by means of virtue. From this individual perspective ethics’ impact is personal, usually characterised by the question: What does an actor itself make good? In this sense ethics relates to the inner world serving for human’s self-cultivation. The other realm of ethics includes - right from the
beginning - the care for other humans, also for animals, plants, and natural resources by graded analogy. Concerning this collective or institutional level - enclosing social and environmental aspects -, ethics is dealing with the question of justice, benevolence, and responsibility, usually characterised by the question: What does an action make good?

Altogether, ethics can be interpreted as an attempt for critical elucidation of human’s moral experience, induced by normative intention. In the context of designing towards a sustainable information the role of ethics can be illustrated by a picture analogous to a lens - representing ethics - focusing rays or beams - symbolising the various activities towards a sustainable information society. In line with Immanuel Kant the underlying understanding of ethics may be interpreted as a “regulative idea”. Such a regulative idea plays a dominating role for research that is in order to arrange our way of thinking, to organise our imagination of phenomena, and to govern our decision-making. Thus it may be possible to say that ethical assumptions - when becoming conscious and chosen by discourse processes within the scientific community, and also transformed into governmental initiatives etc. - can guide environmental informatics’ research programme.

3 Guidance by Ethics and Responsibility of Environmental Informatics

The major third section discusses the core problem of any ethical framework that may contribute to handsome guidance, in this case to design towards a sustainable information society: that is to bridge the obviously “ethical gap”. This gap can also be called “Einstein-Dilemma” (Isenmann 1998, 69): As stated by Albert Einstein, on the one hand we are enabled by powerful means of (new) technologies, science and economy; however, on the other hand our underlying concepts of ends, purposes, and main reasons are quite rough, partially vague, and often unclear. So what to do is that we should overcome this current crisis in fundamental orientation.

Concerning the obvious imbalance between almost technological omnipotence and more or less ethical incompetence, it will be inadequate to design towards a sustainable information society just according to techno-economic imperatives. Without an elucidation about ends and goals, and without a reflection about human, social, and environmental consequences by considering ethics - as Jürgen Mittelstraß (1992, 221) says - we might become “information giants” having huge data bases with detailed information at one’s disposal. However, at the same time, we will remain merely “knowledge pygmies” who lack of ethical thinking about ends and guidance.

In order to present a reasonable and well structured concept, the proposed basic ethical framework (fig. 2) is build up on valuable insights of Hans Jonas and Ulrich Beck, supplemented by conclusions of Jürgen Habermas, and corresponding with

<table>
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Fig. 2: Basic ethical framework, conceptualised

Beck introduced risk society as an industrial civilisation which is characterised by produced risks arising from major use of new technologies e.g. nuclear, genetic, and ICT. The essence of Beck’s comprehensive social theory is that these risks are resulting from our way of industrial manufacturing, business, and lifestyle. The character of this new kind of risks is different from ordinary risks of life because they are produced in order to gain techno-economic profit. Further, these risks may have harmful consequences across the full spectrum of contemporary existence, ranging from bodily and personal to familial, public, biological, transnational, and global.

Jonas connected the ambivalence and risk producing characteristics of new technologies with ethics noting that the classic concept of responsibility has to be enhanced. He presented a comprehensive ethical approach, centred by the “principle of responsibility”. According to Jonas, responsibility should enclose three new aspects in response to industrial techno-economic challenges. These aspects should be considered additionally in comparison with previous ethics that are: global ethics, including the entire population of the world; environmental ethics, including the whole environment and non-human nature on mother earth; future ethics, including a long-term perspective as well as upcoming spatial and temporal side-effects.

Both, Jonas and Beck are seen as pioneers in order to lay a ethically reflected underpinning for the design of a sustainable information society, one that is compatible with other fields of applied ethics e.g. economic ethics and social ethics. Despite apparent conceptual differences and though certain terms are different, the above framework (fig. 2) shows two important similarities: Firstly, responsibility is seen as crucial topic within current ethical approaches, often put into the centre. Secondly, the range of responsibility has been expanded, enclosing three substantial domains. Operating on global scale like to design towards a sustainable information society
brings problems at global level. Problems at global level again require responsibility capable of addressing also problems of global scope. Hence an ethical framework which aims to provide useful guidance to design towards a sustainable information society should deal with specific characteristics of information society, and it should also encourage contributing to reach the goal of sustainability.

Considering ethics explicitly in practice, (environmental) informatics seems to be in a premature stage, yet (Schefe 2001). Perhaps, with respect to design towards a sustainable information society, we are only at the beginning of a voyage of ethical elucidation. However, although such a voyage obviously does not take place in a broader sense, it is still significant because an ethical elucidation - which is “meta environmental informatics” - represents an essential element of computer scientists’ professional task and duty. There are at least three main reasons that ethical basics and basic moral concepts should be reflected within environmental informatics:

Firstly, it is up to environmental informatics itself that computer scientists are ethically aware. Primarily it is their turn, they are most important addressees, and they are able to reason on ethical thinking carefully. Secondly, clarifying meta environmental informatics implications is nothing really “outside” environmental informatics. Undeniably there is no need to import these implications from outward into informatics resp. computer science because they are already internal, always implicit, and usually inherent. Thirdly, background assumptions and essentials of environmental informatics are defined, or, at least, influenced by ethical basics. Hence it is a serious question of fundamental categories and reputation of environmental informatics as emerging scientific discipline that computer scientists take care of ethical awareness and take their societal responsibility.

4 Verifications to Design towards a Sustainable Information Society

In the forth section a set of three essential verifications concerning human, social, and environmental acceptability is proposed. Computer scientists should consider these verifications as minimum when they take their responsibility to contribute reaching the goal of a sustainable information society. When a basic ethical framework is accepted, perhaps as obligatory or mandatory agenda by environmental informatics, this will effect research in theory and practice. For theory, the role of environmental informatics within the scientific community could be upgraded. This upgrading contributes e.g. to meet requirements of postmodern science that are antidogmatic, promoting ethical awareness, providing multiplicity of perspectives, and encouraging pluralism of methodologies. For practice, being ethically aware provides a helpful heuristic to derive sustainable innovations.

However, any ethical framework remains fashionable rhetoric and smart theoretical idea without been put into practice. Hence the proposed framework is transformed into guidance by a rule of thumb containing three verifications (Isenmann
1998, 70): (i) verification concerning human acceptability, addressing personal side-effects and acceptance by individuals; (ii) verification concerning social acceptability, aiming to society’s sufficiency and regarding social side-effects; (iii) verification concerning environmental acceptability, relating to nature’s consistency and with reference to environmental side-effects. The verifications are derived from the basic ethical framework (fig. 2), corresponding with essential dimensions of responsibility.

Ethics is much more than a cookbook for simply copying one-to-one. However, the three proposed verifications can be used as rough but fundamental rule of thumb. They should be considered - after having specified for the research programme of environmental informatics - as minimum when we are interested to design towards a sustainable information society. According to a dictum which is assigned to Joseph Weizenbaum: we cannot predict the future but we can care for it.

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