Informatics and Society

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INHALT:

1. Assessing and designing ICT
2. Building a science of the information society
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      2.2.1 The social dimension: the formation of information society
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Literatur

“Informatics and Society” is the title of a discipline which is well known in the German speaking region (FRIEDRICH/HERRMANN/PESCHEK-SCHRÖDER/ROLF).

In this context, “informatics”, if not used to have the meaning of “information (and communication) technologies” – I(C)T – themselves, is the English translation of a German (and, for instance, French) term – “Informatik” (“l’informatique”) – that denotes the scientific discipline that is about ICT.

This paper deals with some implications for the discipline of informatics when extended to investigations in the connections between ICT and the societies of today. It will be argued that Informatics and Society marks a special step in the development of informatics, namely that step that integrates the assessment and the design of ICT (part 1). This step, however, is seen as a mere transitional phase, because it is directed towards becoming part of an all-embracing, new science that will support societal development in the so-called information age (part 2).

1. Assessing and designing ICT

The character of informatics is still widely disputed (HOFKIRCHNER 1995). Either a relationship to various theoretical disciplines is established. Some consider that informatics is a branch of mathematics, as it is concerned with abstract structures and algorithms. Others proceed from aspects of hardware and electrotechnics, and attempt to demarcate informatics as a technical discipline that investigates the performance and reliability of the computer. Again others tend to place the design of information systems in the foreground, and stress the role of informatics as “Gestaltungs-,” organisation, and work science, that would then include informatics among the social sciences. Linguistics as well as library and documentation science focuses on aspects addressed by the humanities. Also, the proximity to the natural sciences is claimed, where research into AI (artificial intelligence) uses the computer as a metaphor for natural intelligence. And, finally, even the connection to philosophy is emphasised, when the mind-body problem is addressed. Or informatics is alleged to be a science which works purely empirically and simply describes all manifestations which relate to the computer, without aiming for theoretical generalisations. Or the opinion is advocated that programming is not actually a science at all, but rather, an art, a craft.

In spite of that the usage of the term “informatics” instead of “computer science” – though more often than
not the German "Informatik" tends to be translated with "computer science" – is a strong indication for the multi-faceted character of the discipline dealing with ICT, in fact, for the multidisciplinary character of the science in question. The famous Austrian computer pioneer Heinz Zemanek who introduced the term "Informatik" in the beginning of its institutionalisation as a particular practice of research, teaching and profession never got tired of stressing the importance of including, above all, the social aspects in this field of study.

The characterisation of informatics as multidisciplinary, fragmenting itself in a multitude of different viewpoints, which co-exist disconnected with each other, turns out to be insufficient, given practical demands that press for a synthesis of the disciplines. The introduction of "Informatics and Society" is an expression of these demands. It marks another important step in the development of informatics, leaving behind its eclectic stage: the integration of the domain of science–technology–society (S–T–S), especially, technology assessment (TA).

This integration may be seen as repercussion of an underlying paradigm shift that affects the development of science and technology on a rather fundamental level.

According to Western thinking, since the days of Francis Bacon the role science and technology have been thought to play in society may have been to better life. But now that the apparent effects have come to jeopardize the aims in pursuit of which inventions and innovations were originally carried out to such an extent that civilisation is at stake, the programme of Bacon must be overhauled in the light of Bacon’s ideals and rationality must be criticised from the angle of reason. The impressions made by the atom bomb, industrial and agricultural catastrophes, hunger, suffering and death in the poor parts of the world, have raised consciousness of the destructive and fallible nature of the human technosphere, the fragile and finite nature of the human ecosphere, and the unsettled, unbalanced nature of the human sociosphere. It has become a part of general knowledge to realize that the existence of such global challenges can endanger the persistence of today’s societies all over the world. The global problems are global in a twofold sense: first, they concern humankind as a whole (as object); second, they can also only be solved by humankind as a whole (as subject). The risk this crisis carries is that humankind may be wiped out. The chance it offers, however, is that humankind may be raised to another level of humanity: it is a chance for a new kind of community to develop among humans, a chance to call to mind values shared by all members of humanity in the face of a possible ultimate catastrophe caused by themselves, a chance to develop reason relying on the self-controlled use of productive forces of humanity which would then always be capable of counteracting destructive capabilities. In this situation, reshaping science and technology is a task whose time has come.

Given that it is a shared value to improve or at least to maintain living conditions for the human race on this planet, the purpose of scientific and technological efforts is to provide a means of coping with global problems. What is needed is self-reflection in scientific and technological progress, that is, the application of scientific endeavor to scientific endeavor itself, in order to redirect scientific-technological progress and help to overcome the fundamental failures of modernity, the application of research and development methods to science and technology for the purpose of their own control. Science and technology can do justice to their original purpose – to alleviate human life and generally make that life more pleasant – only when they are no longer left to pursue their seeming natural course. Instead of being left to their own dynamics, they should be deliberately put into operation after appropriate reflection and careful consideration, and should be managed with conscious control, i.e., when their programme is executed with respect to the ideals of the survival of humanity in a future in which it is worth living, and when a constant control of the results of the implementation of the programme is instituted. That means, that science must devote careful consideration to its technological consequences in society, must anticipate possible desired or undesired effects, and must carry out any appropriate readjustments or reorientations.

The foundation of TA and its development up to now indicate how far this process of self-reflection has been implemented throughout the sciences (HOFKIRCHNER 1994). Beginning in the late sixties, TA began to spread over the OECD member countries, and in the eighties and nineties there has been a move away from the pure assessment of the effects of technology, via subsequent evaluation of technology, towards an anticipatory design of technology – towards an integrated, systemic, contextual design of technology which will not only work diagnostically and therapeutically, but also preventatively. Hand in hand with this transition from damage limitation and repair to precaution in the sense of a controlled development of the relationships between humans and nature, goes a scientific change away from the exclusive study of the technical, ecological and socio-economic consequences of technical progress towards a simultaneous consideration of both the circumstances of its genesis and the chances of exerting an influence on them: to assessment and design of technology in one, design meaning shaping the whole range of technology (in German "Technikgestaltung").

TA in this broad, new sense must be based upon a philosophy of the binding between technology and culture that opens up room for new developments on both sides, as opposed to an eternal cycle of the same
Technology is often considered to be a means to a particular end, the means being artificially created, not natural, and something which is not directly necessary for the individual or end-user; it serves rather to fulfil the need to produce something, which is later to be consumed. However, technology may be looked upon as more than just the sum of such artefacts, which are merely the crystallised, concrete manifestations of human behavioural patterns. A method is the "how", the way in which a goal is reached, and which involves the use of means. A means is a medium, in that it mediates between the starting point and the desired result, regardless of what sort of action is involved. So, technology also includes the know-how involved in the use and application of the artefacts. In short, technology is deemed to embrace the ways and means of acting in pursuit of a goal.

Using the same analogy as for technology, one could mean "culture" to be an equally artefact-based concept, which is not a means to an end, but an end in itself. That is to say, it is not in itself an essential of life, but rather something which represents a human desire, i.e. something which separates humans from other animals. But it may be reasonable to realise that there is a notion that culture is not only the result of a process, but also this very manufacturing process as it moves towards the goal; that is to say, culture is defined as a characteristic of goal-oriented actions, i.e. the striving towards goals as well as the goals themselves.

The use of technology makes every action one which is no longer unique to any individual person. Technology is based on co-operation, be it in the application of special methods, the implementation of these in specific social areas, their invention and development, or in any situation where the skills and knowledge of other members of society are required. The same holds for convictions, value judgements, instructions, standards, behavioural patterns and other elements of culture. These are just as much a part of the context of life in which individuals are set, and they promote certain technological methods but discourage others. Technology makes every technologically mediated action into a societal one, and its use is one of the characteristics of humans which make us separate and different from other animals. Technological development is part of societal development; this means that technology is part of society, and so their relationship to each other is one of part to whole. Society is the all-embracing factor in this context.

In every part-whole relationship, the parts are the necessary preconditions for the emergence of the whole, but are not the sufficient condition for the complete determination of the result. The whole arises from the parts, but then exerts control over them in the form of downward causation; the parts are no longer independent of each other, with separate existences, but are dominated by the whole. The dialectic of whole and part as regards technology and society is therefore as follows: technology has the meaning, the purpose, the task of functioning as means and method for solving social problems. Social interests are thus in the origin and manifestation of technology, in its invention, diffusion and application, in the entire process of its development, as its reason for existence. This, however, is insufficient to enslave technology completely. Technology is ambivalent; sometimes it appears to resist our intentions by wholly or partly failing to do what is wanted of it, other times it not only fulfils our expectations but goes on to do other useful tasks which had not originally been anticipated. Technology represents potential for the realisation of social goals. These technologically realisable goals may correspond to pre-existing goals within society; the practical attainment of these by technological means may, however, cause them to change, at least slightly. It is of course also possible that the intended goals may differ from those which can be reached with technological support. In this case, new technology may be developed in order to meet the requirements, or the requirements may, as it were, be adapted to fit the reality of what is technically possible. Realisable goals do not therefore always exist at the start of the process, but may be discovered as options made available by technology. Whether society decides to pursue these goals on the grounds that they are possible is no longer a question of technology, but rather of social decision-making.

In contrast to this philosophy of TA, two ideal-typical extreme positions can be distinguished, each making absolute one direction of determination. The first of these is technological determinism, which postulates the total, or at least dominating, influence of technology on the social sphere, be it society as a whole or only in part. Technology is supposed to develop more or less under its own control, pushing social development along as it goes. This may be interpreted positively or negatively. An uncritical opinion of Marxist origin saw social advancement as an inevitable result of technical achievements, just as the ideology of the bourgeoisie justified the progress of the technically possible as socially desirable. An entirely opposed view is held by fundamentalist "Greens" and environmental activists, as well as by reactionary elements, who hold technological development responsible for the loss of important values in society. Neither philosophy accepts the possibility of technological development being influenced in any way, seeing it as something like the magic broom which the sorcerer's apprentice could no longer stop or control. Both ignore the fact that there would be no such development if multinational corporations and national governments were to stop investing in research and development, if there were no economic, military or political grounds to divert
their resources into these areas. The fact that on a micro-level there are countless thousands of engineers constantly involved in technology design, and that on a macro-level managers and politicians dictate which technological options are realised, supports the second theory, social constructivism, that technology is deliberately constructed to be a part of society. The dominating view of the t