Information Resource Management
An independent publication sponsored by Ericsson Information Systems as a service to management in the converging fields of office automation, data processing and communications.

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Trends in telecommunications
Graham Bunting, Editor

INTERVIEW
The leading trend in telecommunications today is the "waking up" of the marketplace to the potential benefits that integrated information and communications systems can have for businesses and other organisations. In this interview with the Editor of IRM the President of LM Ericsson discusses this and other trends and their implications for businesses, PTTs, Western societies and the Third World.

Information and the post-industrial economy
Tom Stonier, Bradford

INFORMATION ECONOMICS
Information has replaced labour, capital, raw materials and energy as the principal generator of wealth in the modern economy argues Professor Stonier. He classifies the new information operatives, describes the growth of the knowledge industry, and appeals for massive increases in spending on social research and education.

The impact of computers on employment
Bruce Gilchrist, New York

PEOPLE AT WORK
What do we know about the impact of computers on employment so far? Bruce Gilchrist of Columbia University examines such data as is available on the effects on the US labour force. He finds no simple answers to help deal with the continuing impacts of information technology, though some useful insights emerge from an industry-by-industry survey.

They want well-trained humans
Jacques Vallee, Silicon Valley

PEOPLE AT WORK
How a scenario for the office of the future proposed by a New York management consultancy was brutally shattered by a few well directed questions about the people involved.

Illustrations by Sue Huntley and Donna Muir.
Negotiating technological change

John Evans, Brussels

The introduction of new technology, particularly information technology, has become a major issue for trade unions in Europe. John Evans, the research officer of the Brussels based European Trade Union Institute, reviews the effects of microelectronics on employment and skill requirements. Trade union strategies in response to these changes include a call for job creation, better job design and the negotiation of technology agreements.

Lessons from the first Industrial Revolution

Enid Mumford, Manchester

The social dimension in systems design

Rob Kling, Irvine, California

The social responsibility of the tech-knowledgeable

Eileen M Trauth, Boston

Computer modelling and public policy

William H Dutton, Los Angeles

Is information technology neutral?

Klaus Lenk, Oldenburg

Public administration

Computer modelling is viewed by its advocates as a neutral but powerful way of helping decision makers to make better decisions. Another view is that it is simply a source of power for the technocrats. More sinister, computer planning can be viewed as an antidemocratic tool in the hands of governing elites. The author puts forward a forthright view that it is simply a mechanism for obtaining a consensus.

Computers in the home

Rex Malik, London

Public administration

Computers are used to process formalised information and this very formalisation may have profound implications for social relations. In particular, rational thinking may be strengthened at the expense of more unstructured creative thinking. The author, a German social scientist, sees worrying parallels between this formalisation and the rational approach of the public bureaucracies and suggests that one may tend to reinforce the other leading to a less human treatment of people.

Social change and information technology

Graham Bunting, Editor

Editorial round table

The need for wider education and for more research into the social implications of systems based on the new technologies were the principal conclusions of a wide ranging discussion by the Editorial Board of Information Resource Management on the potentially explosive effects of information technology on society.
The Social Responsibility of the Tech-Knowledgeable

Should computer professionals just do their jobs or have they wider responsibilities? Should they do as they are asked or provide what they know is needed?

At differing rates all societies are becoming information intensive. As a consequence, a new power base is emerging. It is populated by a class of people who can be termed the “Tech-Knowledgeable.” Their power derives from the knowledge they possess and the resultant influence they have both within organisations and in society in general. It can be argued that these people have a responsibility that goes beyond the general trust society places in them as professionals. In an increasingly technological society, those who manipulate the tools and thereby manipulate the information must be held accountable for the power they possess. Not only are the technologically sophisticated influential as a single profession, but increasingly other professions are dependent upon them. Virtually every profession has a body of knowledge stored in machine readable form and accessed via database systems. It is the information and computer professionals who develop the systems that manage the information which other groups will use to make important decisions.

Given this situation, a number of issues can be identified which address the interplay between the growth of information technology and the appropriate role of the technological elite. Some require immediate response; others should be addressed some time in the future. However, all should be considered by decision makers who are establishing policy in this area.

Clearly, computer professionals should not engage in unethical activities. In some cases what is unethical is also illegal. But there are also numerous examples of the law not keeping pace with the rate of technological innovation. Well publicised accounts of computer crimes often point out that the criminals did nothing illegal. However, the fact remains, for example, that violating confidentiality is wrong whether or not privacy legislation extends to the particular organisation involved. Taking the property of another is wrong behaviour whether one uses a gun or a computer terminal. This applies to the unauthorised use of another’s computer resources, proprietary programs and private files as much as it does to their financial assets. The principle remains: using the computer does not absolve anyone from the requirements of behaviour that are expected in non computer mediated situations.

Another concern of immediate importance is accountability for professional behaviour. One example is the requirement that system designers do more than respond to the client’s expressed need. It is the Tech-Knowledgeable who understand the implications of the technology and they should be pointed out to the client whether or not they ask about them. For instance, unsophisticated clients might not anticipate the need for adequate security. They should be made aware of such things. At the other extreme, consultants and vendors should not take advantage of computer illiteracy by creating situations of dependence upon them. This has been done by the failure to provide adequate system documentation, altering system software so that the vendor warranties and maintenance contracts are voided and by changing the computer hardware so that standard programs no longer run on it. There are limits to caveat emptor.

Informaticians should always work in the best interests of the client whether they are directly employed by that organisation or act as consultants. Thus, while it may be intellectually stimulating for programmers to work with leading edge hardware, this may not be in the company’s best interest. More so than many other profession, those knowledgeable about sophisticated technology are listened to and their recommendations are followed. These people are therefore accountable for the advice given and the resultant effects.

A third issue speaks directly to elitism and the responsibility of power. Increased automation leads to increased centralisation of information whether the computing environment is a single large computer or many decentralised ones. Either way the information is centralised around the machines and those who manipulate them. Social responsibility requires that these individuals be sensitive to the power that they hold, and act accordingly. In addition, the technological elite have a responsibility not to perpetrate their power by withholding information - the source of power - from others. This is done frequently with the use of jargon. Using terminology that excludes others from meaningful involvement should not be condoned as idiosyncrasy. It has been a successful method of maintaining power by keeping actions removed from oversight.

A final issue of immediate importance relates to the notion of the business enterprise as a subsystem of society. Because of the changes brought about through advanced technology, those responsible for implementing and managing such systems need to act
with an awareness that their actions greatly affect outcomes. Often the outcomes extend beyond the bounds of the place of employment. Displacement is one such example. Privacy invasion is another. Customer harassment due to computer malfunctions is a third. Computer professionals have a responsibility to anticipate and plan for these eventualities. To those who would argue that it is the responsibility of the employers of systems analysts and designers to explore the higher order effects of the technology, the question can be posed: Who is better qualified to probe the unintended consequences of technologies than those who build them and design the environments within which they will operate?

**Computerised perceptions of reality**

A little more abstract but no less important is the matter of the impact of information processing technology on the reality it is designed to represent. As society becomes increasingly information based, decisions and actions are increasingly dependent upon formal information our perception of reality is shaped by the tapes, disks, programs and data that govern this information. Those who manage such tools share responsibility for the extent to which this is an accurate representation.

An example is the use of computer based systems for the screening of job applicants. Care should be taken that what can be easily stored in bits and bytes do not supplant the totality of the individual. The US Privacy Protection Study Commission noted the inherent right of individuals to control information about themselves whether it is communicated through dress and behaviour or stored in a data file. The charge to information professionals is to closely monitor both the uses of such systems and the procedures governing the type of data that is stored.

A little further ahead, to anticipate and hopefully prevent some of the situations discussed thus far, a proactive approach to information planning and management needs to be adopted. Underlying this next issue is the belief that people have intrinsic value that is different from and more important than machines, money and materials. Since the beginning of industrialism, this notion has been challenged. Today, as never before, it is under attack. It is not merely the tasks of record keeping and paperwork management that have been drastically changed. Perhaps more significant are the structural changes in the nature and meaning of work that result from the automation of the office and the assembly line. The increased mechanisation of tasks has contributed to the increased specialisation of labour and the resultant fragmentation in the workplace. While specialisation has its advantages both for the employee and the business enterprise, it has its drawbacks as well. Individuals have needs and expectations of their jobs that go beyond financial reward. The introduction and management of automation that does not respond to the need for social satisfaction, self-esteem and personal growth is morally suspect and bad business practice.

The introduction of technology is usually accompanied by some resistance to change in general and to the technology in particular. Those responsible for such innovations should be sensitive to and responsible for dealing with this resistance. Older employees who have worked in a certain fashion all their lives deserve more than an after-the-fact briefing on the new system that has radically altered their way of doing things. They should have counselling and educa-
tional services available to them. Again, this recommendation is consistent with management principles. No technology, no matter how sophisticated, will be successful if there is sufficient resistance to it.

Closely tied to the issue of resistance is that of organisational change. Altering the way information is processed and communicated has an impact on the organisational structure. This is the case whether or not the lines of authority are redrawn. Data processing personnel have a responsibility to contribute to a humanised work environment through the establishment of procedures that acknowledge the impact of technology on the operations of the organisation.

Part of the motivation for professional responsibility on the part of the technoknowledgeable derives from the fact that others' jobs increasingly depend upon them. They should therefore be sensitive to the changes in other disciplines and professions that may result. On the horizon are expert systems which assist in the decision-making activities of a given professional. Examples are systems to support the architect in the design of physical structures, and medical diagnosis systems for use by doctors. One might wonder how a professional can be held personally responsible for decisions and actions when they are increasingly influenced by the operation of such computer programs - written by someone else. What happens to the implied value placed upon professional judgment? Judgment is a characteristic that still eludes the domain of the technology. Are there limits to professional decision making that computer programs should be allowed to make?

Paperwork protection for individual privacy

It has already been noted that increased use of formal information for decision making influences the perception of the entity about which the information is stored. This notion can be generalised to suggest that the quality of information itself can be changed with the use of autolisation. The charge to the technoknowledgeable is to be aware of this potential and to use this awareness, in a responsible and ethical manner, to influence the individuality of information. The content and form of the information is a product of the decisions and actions that one takes. If one is not aware of the potential impact to a human being, or society in general, then it is open to debate whether one has a social responsibility as a technoknowledgeable.

Some might contend that the content of information remains the same whether it is stored in human or machine readable form. An alternate view suggests that obtaining data in concentrated form (i.e., from the computer) yields a different understanding of that same data which was collected in piecemeal fashion through manual methods. (This same logic has led some to suggest that paperwork inefficiency has been a mechanism for the protection of individual privacy.) In a similar vein, controlling the flow of data can alter the meaning obtained from the information. The dissemination of too much or too little information can become a vehicle for manipulative persuasion. Advertising regulations acknowledge this.

The final set of issues are presented both as recommendations for action and as topics for reflection. They need to be addressed by somebody, and as the technoknowledgeable understand the greater implications of their technology, it should be them.

Both the academic and popular literature have published articles that deal with the controversy surrounding computer use. "Computer paranoia," "hacker mentality," and other labels have been used to describe individuals who apparently derive more pleasure from interacting with machines than from interacting with people. These sometimes humorous anecdotes have a serious side to them. They should give one pause to consider the increased rationalisation that is pervading society. When it is more often the case that "the computer can do it better than people": will there be an accompanying trend toward devaluing the person? What is the potential impact of decreased social interaction in the face of increased involvement with machines? Who, then, should be responsible for helping society cope with the "hacker mentality"?

Another area for involvement of the technologically sophisticated is that of influencing the development and use of new tools. The rationale for this suggestion is based upon what was stated earlier: those who best understand the capabilities of the technology share some responsibility for the uses to which it is put. This viewpoint is consistent with another: scientific research is not amoral. Only at the most theoretical levels can the context be totally removed. Thus the research and need to redefine that computer professionals should be actively involved in monitoring socially questionable uses of computers, such as for clandestine intelligence gathering and for assisting in the subversion of governments. There is precedent for concern on the part of scientists and technologists about the uses made of their inventions. Physicists working on the atom bomb later became some of the most outspoken critics of its use. Today, associations such as High Technology Professionals for Peace reflect acute awareness of the responsibility of scientists for the uses made of their research.

From the technical/pragmatic to the societal/ethical

Rather than focusing on new technology for its own sake, the technoknowledgeable should begin during their academic years. Their viewpoint should be that of societally oriented perspective. Such an approach, rather than a reactive attitude which attempts to counter existing behaviour, a proactive approach encourages social responsibility. The need to be knowledgeable a societal viewpoint is increasingly being incorporated into the curriculum. This is done both within the context of existing courses and through the inclusion of new courses designed specifically for professional development.

In the education of the technoknowledgeable, a societal viewpoint will be increasingly being incorporated into the curriculum. This is done both within the context of existing courses and through the inclusion of new courses dealing specifically with social responsibility. The goal of both approaches is to balance the technical/pragmatic orientation with a societal/ethical one. Students should learn to see the societal ramifications in the context of an overall cost-benefit analysis.

Finally, codes of ethics should be designed and enforced. That is, professional responsibility should be closely linked to the particular aspect of the profession in which the individual operates. The issues might be different for a system designer than for a programmer, for example.

Enforcement of professional responsibility among the technoknowledgeable should begin during the formal education and be reinforced in the workplace. The assumption is that increased awareness will lead to heightened sensitivity which will in turn result in appropriate behaviour. This outlook needs to be supported by specific activities on the part of management. Policies should be in place to cope with the most immediate concerns. Planning for the intermediate and long term issues should be undertaken.

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