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Introduction: People-oriented introduction of information and communication technology in organizations

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Introduction: People-oriented Introduction of Information and Communication Technology in Organizations

Information Technology (IT) is often associated with issues of data processing and information management through large-scale information systems. However, for the last 10 years IT has not only referred to (1) computer-assisted information processing technologies, but also to (2) computer-assisted communication technologies, and (3) computer-assisted decision support technologies. It is therefore more adequate to speak of Information and Communication Technology (ICT). These advanced forms of IT enable the development of new forms of work and organization, such as distributed teamwork, mobile work, telework, inter-organizational networking, and outsourcing activities to other countries.

Traditional information systems are now being complemented or integrated with decision support systems, expert systems, and what is sometimes called "groupware", i.e. technology supporting, for example, electronic mail, video-conferencing, mobile calling, and flexible command and control systems.

The growth of this form of technology is related to the fact that organizations have to cope with changes in the socio-economic environment. General societal and economic developments increasingly require an international orientation, geographical distribution, and increased flexibility of the production process and workforce. Moreover, fierce competition forces organizations to reduce overhead costs as much as possible. Very few companies can evade the pressure for increased flexibility in production processes and organizational functioning, reflected in phenomena such as "just in time" logistics, decentralization of decision making, and flexibilization or even externalization of labour. Some firms have undertaken a dramatic reordering of the primary processes through what is called "business process redesign". IT is adopted and designed to solve problems caused by these changes.

The implications of these developments for work and workers are only slowly becoming manifest. A widely divergent world of work is dawning in organizations where "mediated co-operative work" plays an important role, in the context of organizational networks, temporary connections, teamwork, and distributed working. In the Book Reviews section a publication

is discussed (Howard's *The Changing Nature of Work*) that analyses the potential implications of these changes for work, workers, and working.

Both organizational and technical design issues will be of major importance to work and organization. Few work and organizational psychologists are presently involved in the technical design of ICT systems, but this special issue of the *European Journal of Work and Organizational Psychology* shows that their participation in the implementation of these systems in organizations is significant.

Technological and organizational innovation requires a theoretical framework to understand the relationships between strategy, technology, and organization, and to guide the change process. The contributions in this issue discuss the introduction of ICT in the frameworks of what are called integrative analysis, user-oriented design, and socio-technical approaches, in some cases comparing this with "business process redesign". Of course these concepts are not new. New, however, is the refinement of these models, the sophistication of the methodology implied by the approaches, and the application to novel situations such as large-scale tele-informatics. Compared with business process redesign approaches, the methods discussed in this issue seem to have more favourable impacts.

Business process redesign in the insurance and health-care sectors is studied by Willcocks and Currie. They compare their findings with the BPR model for change presented by Hammer and Champy (1993). The cases show that radical re-engineering was applicable in a definable business unit with a relatively simple structure, clear objectives, and where performance and improvement is easily measured. The results also point out conditions under which a unitary perspective on the organization cannot adequately address political and cultural issues. Radical re-engineering offers senior management the opportunity to "forget the past". In this process human resources are treated largely in mechanistic terms. Difficulties are engendered by overemphasizing the need for transformation, "starting over", and downplaying the role of history and continuity.

Boonstra and Vink argue that contemporary socio-technical system theory provides a better knowledge base for redesigning as well as developing organizations through learning processes. In this respect they see the theory as more mature and helpful than the "loose collection of insights and methods" that make up business process redesign. However, further development of socio-technical system theory is needed according to the authors. In particular, they emphasize the field of strategic development and issues concerning barriers, power, and influence during fundamental change processes. They claim that impediments to technological and organizational innovation are seldom related to the technological system. Barriers for innovation and reasons for organizational conservatism are mostly found in the social system. Case research in an automated clearing

house for payment transactions indicated six barriers in the social system: the existing division of labour and poor interfunctional teamwork, the norms and values limiting people's ability to change, top-down leadership and poor vertical communication, inadequate management skills, and a linear and formal process of decision making on issues of innovation.

The results of Wastell and Cooper are in a similar direction. They report a comparative analysis of two projects involving the computerization of control room operations in two ambulance services, with strikingly different results. These contrasting outcomes are attributed to two main sets of factors: the design philosophy of the more successful case was "user-centred"; the aim of technological innovation was to support and augment the role of human operator. In contrast, the less successful project appeared to embody a highly Tayloristic philosophy, accentuating the replacement of unreliable human labour by an automated system. In terms of implementation strategy, two features were recognized as critical success factors: top management commitment and user implementation.

Eason, Harker, and Olphert argue that we need methods to support participative and integrative systems development in order to ensure that organizational requirements and options are considered alongside technical opportunities. In their contribution the authors review the methods available for integrative and user-centred work. They conclude that the development of methods has concentrated on approaches that are useful in the implementation phase. However, this is often too late to make major changes. On the other hand, user participation earlier in the development process is often limited to asking users to review abstract technical descriptions in order to judge organizational implications. The authors developed the ORDIT (Organizational Requirements Definition for Information Technology Systems) methodology to provide stronger support for user-centred integrative analysis and design at an early stage. The method provides a mechanism integrating the business process, the social system, and the development of future alternative socio-technical scenarios. It helps stakeholders to understand the implications of technology sufficiently early for them to be able to influence the direction of development. The application of tele-medicine in health care is presented as a case study to demonstrate how this method can be used.

Van Offenbeek and Koopman argue that "user participation" should be viewed in a more differentiated way. They show that, although most system developers nowadays indicate that they accept the necessity of user participation, the daily practice is often different. The authors plead for a switch from the concept of "user participation" to "contingent interaction" among parties involved. They present a contingency model in which five types of risks are described: functional uncertainty, technical uncertainty, conflict potential, resistance potential, and material preconditions. The contingency

model specifies the approaches of interaction that are supposed to be more appropriate under each condition. Early results based on seven case studies provide some support for this model.

The final contribution, by Hanappi-Egger, focuses on systems supporting group decision making and co-operative work. She analyses bargaining over work-distribution schemas in professional work groups and investigates how the group dynamic aspects can be modelled in order to design a technical support system. The advantage of such a decision support system is that it allows preferences to be articulated in a more democratic and less threatening way.

The contributions in this issue vary widely in their scope, in the sectors they cover, and in the technical systems involved. There is, however, one similar message to be found throughout all the approaches: It is not the information technology itself that is the crucial factor for quality of work, for workers, or for the organization, but the strategy adopted to integrate the technology in the changing organization. This issue shows that theory and practical methodology of achieving such an integrative approach have progressed substantially over the last decade.

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