communications and information technology systems. Therefore, sweeping statements to the effect that demand for communication services is a function of economic variables and nothing else give an erroneous impression by excluding the military and its influence on the market through large-scale subsidies and support for research and development. The authors also maintain silence on another point which, to my mind, is as important as it is sensitive: the impact of political decisions for the control of technology and information flows. The famous Dresser case, which involved a French subsidiary of the US company Dresser, showed that it was enough to implement sanctions by preventing access to the parent company's computer in Pittsburg. Obviously, such events will, beyond economics, influence attitudes concerning domestic independent capacity and the vulnerability of free flow of information.

It is sometimes difficult to guess for which readership this book is intended. It is, of course, reassuring to know that the authors have undertaken their task "with much of the aplomb of trained economists" (p. xiii). Sometimes, though, the aplomb seems to get out of hand. There are passages that make interesting *non-sequiturs.* There are appealing, somewhat surrealistic, mixed metaphors ("the development of TBDF issues has floundered on the rock of indistinct lines of demarcation", p. 28). There are some startling contradictions. The authors state that while esoteric reference to technical matters are maintained, every effort has been made to present the main arguments in a manner that would not try the patience of readers unfamiliar with economics. What then is such a reader supposed to make of statements such as: "the model can be conveniently estimated via the use of polychotomous probit regression procedures" without any explanation of these terms (p.177)? Finally, it would be helpful if writers on information questions, including me, would be more rigorous in distinguishing between data, information, and knowledge.

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The Information Society *by David Lyon*
(Polity Press, Cambridge, UK, 1988) pp. x + 196, ISBN 0-7456-0260-6

David Lyon introduces his analysis of the concept of 'information society' by stressing the interaction between technological change and social evolution. He argues that the literature on Information Technology and Society has too often emphasised the costs and benefits of technology-shaped potential futures without paying enough attention to the social origins of technological development. The belief that a new 'kind' of society will emerge exaggerates both the neutrality

of technological change and the extent to which it is perceived as exogenously determined. The result is to prevent a discussion on alternative views of the new social problematic of the information society. So, to Lyon, the information society slogan and associated utopias obscure the vested interests and contradictions in visions of development because it is generally not recognised that social and technological evolutions are not separable. His implicit concept of information technology (IT) refers to the observable economic integration of the sectors of information technology and computer sciences. The associated concept of the Information Society relates to the most popular utopian visions of the likely social outcome emerging from the growing importance of IT.

Throughout his book, Lyon emphasises the fact that evidence regarding the possible shift in sources of power in society and its economic structure is not convincing. His major contention is that we ought to realise that we can modify the social outcome by asking the appropriate ethical and normative questions. The future is neither socially nor technologically determined.

Lyon proceeds with a treatment of inter-related themes: the sources of technological change, social classes, employment, democracy, development and transnationals, culture and ideology. His approach is mainly to tackle the major issues within each theme by exposing the dominant views that have shaped them. Not surprisingly, in most cases both a clearly Panglossian and a Pandoran view emerge. To some, technology will solve our socio-economic problems while others predict a future society of surveillance, control and oppression. I shall give a brief overview of the various elements condensed in each theme.

While dealing with the sources and reasons for development of IT growth, military, commercial and government-related factors are explored. Lyon comes to the conclusion that no single historical contribution can be identified as a trigger. Instead, specific interests and values appearing in each of the sectors have played that role.

The discussion proceeds to the concept of information as a factor of production, a source of power and its likely impact on class structures. The post-Marxian concern that power might be shifting from owners of capital to those controlling access to information is reassessed, but no conclusion is reached, apart from the need to pay more attention to power and less to technology *per se*. Again, the author brings a large spectrum of views to the subject, paying particular attention to the difficulties arising in trying to evaluate the importance of the information sector. The fact that the information sector cuts across the traditional sectors of primary goods, manufacturing and services and that information should be differentiated from knowledge is mentioned as a warning against the work of those who try to assess its importance, but no new suggestion or framework arises from the criticism.

Other traditional concerns are raised when Lyon attempts to survey the long term effects of IT growth on employment in terms of the potential changes in work structures, the leisure shock, the links between the formal and the informal economy, the issues of de-skilling, job losses, productivity, quality of job experience and equality. The last element seems to be his major concern, a more egalitarian work structure due to changes in the work style and organisational needs meaning either the blurring of boundaries between labour and management or a decrease in male-female or racial discrepancies through more democractic work allocation processes. While his treatment seems overall quite pessimistic, only an exposition of the major views on the issue is given and very little evidence and new perspective on the subject are provided.

The role of new technologies in promoting democratisation through an easy access to technical means of communicating opinions is put in parallel with the threat of surveillance and loss of personal privacy, a debate which has already hit Australians in an incomplete manner with the issue of ID cards. The two issues are not new products of the IT society. According to Lyon, "there is no evidence that the opportunity for push-button polling would re-activate the increasingly apathetic and unengaged citizens of modern democracies" (p. 91). The danger of seeing information being allocated through very imperfect mechanisms leading to control, surveillance and anti-democratic tendencies is also not particularly novel but enhanced because of the new dimensions and complexity of the potential problems. Schiller, in his *Information and the Crisis Economy,* provides some facts and cases necessary for a better evaluation of the problem.

No new light is shed on the even more traditional issue of the widening gap between the North and the South and the role of the transnational corporations operating transfers of resources outside the control of the populations concerned. While the less developed countries see the cheap labour advantage undermined by the growth of automation and the increasing ease with which investments can be relocated across borders, advanced nations invest at an increasingly faster rate in telecommunications equipment to widen the technological gap. Again, Schiller provides an important source of facts, lacking in Lyon's picture of the situation. While the latter does not doubt that the potential for development of IT is huge, he argues that realism about the numerous obstacles to its realisation is necessary. He warns against ahistorical approaches to social development that conveniently forget the connection between imperialism (especially cultural), ethnocentrism and technological development.

The interesting issues of culture and lifestyle are kept for the final chapters. Cultural transformations related to IT growth are once again viewed as potential promises or threats to entertainment and leisure, including personal human interactions with computers in everyday life and potential global changes in lifetyles. The numerous views mentioned in the book include the danger of commercialisation of cultural commodities (the increasing importance of ability-to-pay to get access to them), cultural imperialism, the 'computer culture' and its extreme, the 'silicon idol' version in which human beings see their degree of 'humanness' either decreased (due to their admiration for the machines) or enhanced (because time and energy are released from the past necessity to work on non self-fulfilling tasks to reach higher aspiration levels). Lyon concludes that the optimistic views lack realism while the pessimists are locked in social-technological determinism and miss the importance of reflexive human action.

In this attempt to find an honest balance between the optimistic and the pessimistic diagnoses found in the literature on the social consequences of the growth and convergence of computing and telecommunications sectors, Lyon provides an interesting coverage of the issues for the non-initiated reader or student. But the reader might have preferred more originality and direction. No new agenda or methodological formulation is proposed to initiate the discussion that he perceives as essential. One may conclude that his persistence not to take a clear position about what he sees as being the most likely future of the information society reinforces his view that it should be seen as an open theatre. He warns that debates on futurology and the social aspects of IT too often show a lack of context (spatial, disciplinary, moral). He believes that no

precise view of the information society should dominate: the options should be open since our understanding of the implications of IT is so limited.

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CIM Computer Integrated Manufacturing: Computer Steered Industry *by August-Wilhelm Scheer*
(Springer-Verlag, Berlin, 1988) pp. xii + 200, ISBN 3-540-19191-7

This book provides a refreshing discussion of computer integrated manufacturing (CIM). The book is unique in that it takes a process oriented approach to analysing the potential impacts of information technology-based process restructuring of the activity cost chain of the firm. Business processes are not an end in themselves, but exist only as means to enable the accomplishment of management goals and objectives.[1] Firms restructure their manufacturing processes to achieve both internal management oriented benefits as well as external market oriented benefits. The internal management oriented gains include reduced raw material and work in process inventory, reduced order turnaround time, greater production flexibility, and decreased labour costs. The external market oriented gains include improved responsiveness to changes in market demand, and reduced customer costs. Though some of the components for CIM are commercially available as stand-alone systems, (for example, computer aided design, production planning and control, inventory management), Scheer provides a thorough analysis of the potential of cross functional systems integration and introduces a framework within which a platform for computer integrated manufacturing may be built.

In the first part of the book, Scheer takes a process and data oriented view of the need to integrate production planning and control, computer aided design, computer aided manufacturing, and the traditional information systems activities. In this context, the author builds a convincing case that one of the critical bottlenecks inhibiting the effectiveness and efficiency of CIM is the lack of process and data integration across the activity cost chain of the firm. Business processes that are designed without a systems integration view tend to result in discrete specialised sub-processes that are sub-optimised relative to the needs of the overall process chain of the firm. At the manufacturing level this is often reflected in long lead times, long process throughput times, and the lack of flexibility and managerial control. To address this problem, Scheer makes two propositions: first, manufacturing firms should strive for greater compatibility in the organisational interface connecting processes and sub-processes of the activity cost chain of the firm; and second, the underlying databases supporting the processes should be application-independent. The book examines in detail the basis for process integration in each of the critical functions of CIM (production planning and control, computer aided design, computer aided planning, computer aided manufacturing, computer aided quality control, and maintenance) and discusses within each area the implications of cross functional systems integration. In essence, Scheer argues that it is the dynamic and synergistic effect between process and data that determines the competitive