Information System Concepts: Towards a Consolidation of Views

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This book presents 17 papers (13 with commentator's responses appended) from an IFIP WG 8.1 Working Conference held in Marburg Germany in March 1995. It also contains four position papers from a concluding panel discussion entitled 'How far Harmonisation'. The International Federation for Information Processing (IFIP) was founded in 1960 under the auspices of UNESCO as a non-profit organisation charged with the promotion of information technology and its benefits. Its membership comprises both national bodies and individuals and it is organised into Technical Committees each of which sponsors a number of working groups. Technical Committee 8 (TC8) is concerned with Information Systems, Working Group 8.1 is concerned with information systems development methodologies. This meeting was the third in a series conducted by the FRISCO (Framework for Information Systems Concepts) Task Group. The editors describe this group as 'charged with proposing a conceptual framework for the field of information systems'. The previous meetings held in 1989 and 1992 were sub-titled 'An in-depth analysis' and 'Improving the understanding' respectively. Such an undertaking is in keeping with the traditions of this Working Group which conducted the CRIS (Comparative Research in Information Systems) series of meetings and publications during the 1980s. CRIS conducted a comparative examination of extant information systems development methodologies. However, there has been considerable growth of the information systems research community and a considerable widening of research approaches and perspectives since this earlier project was initiated.

While 'towards consolidation' may have been an understandable objective of the 1995 meeting, the papers offer a valuable insight into continuing philosophical disagreements not simply over the conduct of information systems research but over the nature of information systems and even information itself. Given the cross-disciplinary nature of information systems' research and development, alluded to by several contributors, this situation is not surprising. In their introduction the editors suggest that different types of information system may call for different paradigms, but that at present differences of approach are more attributable to the historical development of schools of thought than to the particular circumstances of their application. Avison and Nandhakumar present a definition of the Information System from Buckingham as 'a human activity (social) system'.[1] In contrast, Computer Science and Software Engineering are concerned with the mathematical theory of computation and the formal development and verification of software systems respectively. However, it is the definition of information used in these disciplines and derived from a purely technical view of Shannon and Weaver[2] which over time has subsumed the richer social and cultural meaning of communication and infiltrated information systems thinking. An understanding of the technical kernel of the processes of human communication is a necessary but not sufficient precondition for the development of computer-based information systems. A failure to break from a technical stranglehold can only reflect a lack of confidence in the distinct discipline of Information Systems. WG 8.1 is seeking to strengthen the discipline through its more coherent definition.

The technical precondition for information systems is still very necessary and while the activities of WG 8.1 have been supplemented by other groups under TC8, concerned with an increasing number of contextual issues surrounding information systems, its original objectives remain valid. These newer groups include WG 8.2 which focuses on

Information and the Organisation and several of the contributors to this volume are also members of the latter group. Their presentation of 'softer' perspectives represents one route to the consolidation sought in the title of this book. Alternative approaches to information systems analysis and have made use of socio-technical and soft systems approaches, the former best represented by the ETHICS method of Mumford[3] and the latter described here by Avison and Nandhakumar in their chapter. 'The discipline of information systems: let many flowers bloom' in the form of the 'Multiview' approach. An even more self-consciously pluralist argument is presented by Avgerou and Cornford's chapter, 'Limitations of information systems theory: a case for pluralism'.

The book follows the order of presentation at the conference, with the majority of papers being followed by a contribution from a nominated commentator and ends with a set of panel position papers on the theme 'How far harmonisation?' Such a literal reproduction of the conference produces both strengths and weaknesses in the book. The presence of commentaries on many of the chapters allows ideas to be placed in the context of the information systems' research discourse and gives a good impression of the tenor of debate. For example, the comments by Voss on Avison and Nandhakumar's contribution exemplify the difference between researchers committed to normative and to phenomenological views of the information systems design process and the corresponding gulf in definitions of research activity and rigour. Stamper's supportive comments on both Holm and Karlgren and Calway serve to consolidate and contextualise two contributions from a semiotic perspective. However, the structure dictated by the original sequence of papers is less helpful in the coherent presentation of the whole range of ideas contained in the volume. Chapters which engage in philosophical disagreement are interspersed with contributions which focus on techniques of immediate practical value to developers of information systems working within current technical paradigms. Thus alongside Avgerou and Cornford's argument for pluralism we find Kelly's 'What is a relationship? On distinguishing property holding and object binding', and Flynn, Knight and Laender's 'Multiple relationships: an analysis of their semantics and modelling' follows Holm and Karlgren's 'Theories of meaning and different perspectives on information systems'. Several chapters offer insights into the vexed issue of the adequacy of existing formal data modelling techniques while Verrijn-Stuart and Oei engage with modelling at the level of the business and meta-modelling of the information system respectively. Other predominantly technical contributions seek to demonstrate the value of a particular philosophical approach, as with Calway's paper on a 'Semiotic approach for object abstraction' which address the object-oriented approach to information systems analysis. This approach seeks to overcome the difficulties of separate data and process modelling by combining data and the processes which act upon it in the form of objects and their attributes. Such an approach promises advantages of modularity and re-useability of the software code produced, and during the last decade has gained from the emergence of technical development environments specifically intended to support it. Schewe and Schewe, Lindgren and Kaasboll all touch on aspects of this particular approach in their contributions. However, critics of 'traditional' information systems analysis, including those represented in this book argue that such technical fixes, however sophisticated, are missing the real problem. Belief in increasingly sophisticated tools might be likened to a 'magic eye' mentality: if the situation in hand is looked at closely enough, a coherent structure, the equivalent of a hidden 3-D image will jump out providing a ready-made framework for a supporting information system. Critics of such objectivism, typified here by Stamper, suggest the real problem is that meaning is the outcome of a process of social construction carried out by and among observers. The result is different emphases and different models of the

same situation. Calway proposes an approach to object oriented analysis which transcends the objectivist paradigm through the use of a semiotic approach.

Taken as a whole the book represents an inevitably pluralistic approach. 'Consolidation' is best approached here by several valuable general reviews within individual chapters, such as that by Avison and Nandhakumar and by introductions to specific relevant disciplines of interest to information systems researchers, such as Holm and Karlgren's discussion of theories or of Rauterburg's use of cognitive psychology in his chapter entitled 'About a framework for information and information processing of learning systems'.

While the book as a whole might be of relevance to anyone interested in the progress and problems of an emergent discipline, it also provides the pragmatic reader from within that discipline with assistance with current development tasks and a source of reflection for the future development of their skills. The price reflects the origin of the material in a specialised conference, and offers a significant improvement over those prevailing with the previous publisher of IFIP Proceedings.

References

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The Tyranny of the Market: A Critique of Theoretical Foundations

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Analysis and policy approaches to many matters discussed in the pages of *Prometheus* touch frequently on the role of the market. The June 1993 issue, for example, reprinted a strong plea by Edith Penrose for awareness that monopoly in its oligopolistic form rather than the 'free play of competitive market forces' was a fact of economic life; and that 'non-equity alliances (often, if not usually, related to technology) may be the nerve channels'.[1] Richard Nelson posed the underlying critique as follows: 'the standard welfare economics arguments do not propose that private enterprise is better than any other organizational solution; only that if certain assumptions are met, "it can't be beat" '.[2] As it is widely acknowledged that the assumptions are not met, he could add that the contemporary welfare economics 'provides no argument that justifies a flawed, patched up private enterprise'.

In view of the pendulum swing towards reliance on just such 'a flawed, patched up private enterprise', Vickers' critique of the theoretical foundations is timely as well as thorough. It will be a pity if it is treated as a book for economic theorists; rather it is a strong challenge to all those who embrace the market faith.

Central to Vickers' discussion of received analytical traditions and concepts is the