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## **Chapter XII**

# **Critical Thinking and Human Centred Methods in Information Systems**

Lorraine Warren

The University of Lincolnshire and Humberside

### **PERSPECTIVE**

Over the last four decades, information technology (IT) has permeated almost every aspect of our lives. From its origins in the data processing (DP) departments of large organisations, where bureaucratic operations were automated on main-frame computers, IT has penetrated ever further into all kinds of organisational activity, largely due to the accessibility of the personal computer (PC) in the 1980s and the 1990s. Beyond that, IT is also involved in many aspects of our everyday lives, such as education, leisure and entertainment, now that the boundaries between traditional telecommunications technologies and computer-based systems effectively no longer exist. This permeation has meant that the range of people now closely involved with IT on a regular basis has expanded far beyond the white-coated experts in the early DP departments, with terms such as ‘the information society’ in common parlance. It is therefore hardly surprising that the discipline of information systems (IS) emerged and is now evolving to meet the challenge of analysis and design in this complex and dynamic social environment. Nor is it surprising that IS is moving on from its early emphasis on highly structured formal methods of analysis and design, designed to cope with the machine-like preoccupations of the data processing world, to a far softer, human-centred focus. There is clearly an agenda for improvement for IS; although the notions of success and failure may be problematic in themselves, we hear of IS ‘failures’ which make the evening news at depressingly regular intervals – Y2K, the UK air traffic control project at West Drayton, the recent Passport Agency fiasco, for example. More generally, a wide-ranging (14,000 organisations) survey in the UK carried out by the Economic and Social Research Council and the Department of Trade and Industry (OASIG, 1996) concerning the outcomes of IT investments makes worrying reading, reporting that:

This chapter appears in the book, *Human Centered Methods in Information Systems: Current Research and Practice*, edited by Steve Clarke and Brian Lehane. Copyright © 2000, Idea Group Inc.

- 80-90% do not meet their performance goals;
- about 80% of systems are delivered late and over budget;
- about 40% of developments fail or are abandoned;
- less than 40% fully address training and skills requirements;
- less than 25% properly integrate business and technology objectives;
- only 10-20% meet all their success criteria.

In the study, it is concluded that the problems are rarely caused by the technology itself, but instead to the lack of attention paid to the people who have to use the technology and also to broader organizational factors. The following far-reaching concerns were identified, *inter alia*:

- the complexity of interaction between humans and technological artifacts;
- the heterogeneity of interests and agendas which exist in organizations;
- the lack of (consistent) user involvement with the design and implementation process;
- the (perceived) association of IT developments with redundancies;
- the turbulent economic environment which organizations face.

The emergence of the social character of technology as a focal point for study has led those working in IS to draw on the disciplines of psychology, linguistics, sociology and anthropology for theoretical sophistication to guide and inform the human-centred design agenda — after all, IS is essentially an *applied* discipline. The trawl for useful strands of theory has been wide: the first part of this chapter begins by presenting an overview of how this is changing research and practice in IS; the second discusses an information systems design project where the application of one particular strand of social theory, critical systems thinking, is illustrated.

## INTRODUCTION

IS has inherited a dominant technocentric positivistic orthodoxy from its early origins when 'computer science' was regarded as a subbranch of engineering. The work of Simon (1981) was influential in ensuring that this agenda was maintained in the organisational arena, through his vision of a 'Unified Science' of complexity and information processing. The idea of organisations as formal decision-making structures under conditions of bounded rationality was a key notion in the development of classical Artificial Intelligence (AI), which seemed to hold so much promise in the 1970s. Orlikowski and Baroudi (1991) concluded on studying the approaches and underlying assumptions in research papers in IS that 95% were based on a positivist epistemology. In a similar vein, Iivari (1991) identifies seven major schools of thought in IS design: software engineering, database management, management information systems, decision support systems, implementation research, the socio-technical approach and the infological approach. He suggests that all seven schools adhere to positivism as their underlying epistemology, with only the school of decision support systems laying claim to any anti-positivistic notions — an interesting move away from classical AI!

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