

III

Developing Systems

- 10. Soft Systems and Hard Contradictions**
- 11. Surfacing Organizational Competence**
- 12. Soft Systems in Software Design**
- 13. Interaction and Transformation**

Part III addresses the core question in systems development: How can we support analysis, design, and implementation of computer-based information systems? This introduction presents four of my own contributions that can help answer this question and it summarizes other related contributions of my Danish colleagues (see table 3 and reference list in chapter 1). Systems development includes a number of core activities, e.g. analysis, design, implementation, and maintenance, and it involves different perspectives on computer-based information systems including technical, symbolic, and organizational (Lyytinen 1987a; see chapter 1, section 2.1). The contributions presented here explore the possible use of SSM (Checkland 1981; Wilson 1984; Checkland *et al.* 1990) as an approach to analysis and design of information systems. SSM is complemented with dialectics to better support organizational perspectives and with an additional soft systems concept based on interactions to better support symbolic and technical perspectives. The goal is to make SSM more useful in relation to systems development.

Chapter 10 analyses SSM from a dialectical point of view. We argue that several of the elements of SSM are expressions of dialectical thinking. But the methodology does not offer concepts to explicitly reflect on contradictions in a design situation. Using SSM we can express contradictions as climates in rich pictures, but in our thinking, they are at most represented as implicit relations between different systems.

Chapter 11 explores this issue on a more practical level. We demonstrate how contradictions can be included in the repertoire of conceptual models that are formed as part of soft systems practices. We argue that this kind of systematic thinking is particularly helpful in making users and developers appreciate challenges and possibilities involved in designing information systems and we show how SSM can be broadened to include the concept of contradiction.

The next two chapters pursue additional attempts to develop SSM. This time our concern is not to broaden the methodology to get a deeper and richer understanding of problematic situations involved in systems design. Instead, chapter 12 explores the use of SSM as a basis for designing application software. We outline a methodology, Rapid Systems Modeling, which was the first prototypical version of our approach to object oriented analysis and design (Mathiassen *et al.* 1993, 1995, 1997).

Chapter 13 takes us one step further in including technical and symbolic perspectives into SSM. We argue that SSM, in addition to the existing soft systems concept based on the notion of transformation, needs a complementary soft systems concept based on the notion of interaction to better support the design of contemporary computer systems. A specific proposal for how to include interaction systems into SSM is offered and we outline the implications for soft systems thinking and practices.

In addition, a number of other contributions to Reflective Systems Development support analysis and design of computer-based information systems: (Stage 1989) offers a dialectical framework to study analysis and design of information systems and parts of this research are published in (Stage 1986, 1990, 1991); (Nielsen 1989) elaborates the role of contradictions in SSM; Finn Kensing has, in collaboration with his colleagues at Roskilde University, studied techniques and perspectives involved in the early analysis activities, see for example (Kensing *et al.* 1991; Bødker *et al.* 1994; Simonsen *et al.* 1997; Kensing *et al.* 1996, 1997); (Kensing *et al.* 1993) presents an overview of approaches to participatory design; and (Mathiassen *et al.* 1993, 1995, 1997) presents an object oriented approach to analysis and design, see also (Mathiassen *et al.* 1994; chapter 14).