

sets can be placed in a hierarchical digraph using the relation of inclusion. A digraph whose vertices represent maximal cycle sets offers further opportunity for interpretation of the system, in connection with the particular contextual relation of interest.

For some systems and some situations, a structural model of a single contextual relation may suffice. At times more than one contextual relation will of concern, consequently several different structural models may be prepared for a given system. Each can be thought of as one dimension of partial description of a system.

Chapter 1, titled "Probing Complexity", discusses the assumptions that underlie the work reported subsequently and the objectives of the research.

Chapter 2, titled "Binary Matrices in System Modeling", introduces the mathematical ideas that form the basis for the structural modeling process and briefly overviews the mathematical nature of the process.

Chapter 3, titled "Surrounding Ideas and Background", presents certain links between this work and prior work. It is hoped to show, in this chapter, that the work reported herein occupies a reasonable place in relation to work by other investigators and to show linkages to various fields of study. The reader who develops a passion for the structural modeling process may want to become familiar with some of this work in other fields since it furnishes very useful collateral information in regard both to structuring and to substance.

Chapter 4, titled "Developing Subsystem Matrices in Structural Modeling", discusses the first phase of a two-phase process aimed at developing the data needed for construction of a structural model. The product of the first phase is a partially filled binary matrix representing some contextual relation among a set of system elements.

Chapter 5, titled "Developing Interconnection Matrices in Structural Modeling", discusses the second phase of the two-phase process, wherein the matrix development begun in Phase 1 is completed.

Chapter 6, titled "On Interpretation of Complex Structural Models", summarizes the important partitions of reachability matrices, shows how to find condensation matrices and skeleton

matrices, and discusses the special nature of cycles that occur in binary relations. It suggests one means for developing the fine structure of cycles. Geodetic cycles are defined and illustrated. It is shown that geodetic cycles can be placed in a hierarchy; such placement may be very useful in interpreting a cycle relation.

Chapter 7, titled "Correction Theory and Procedures", indicates that structural modeling is inherently iterative, and that it is natural to expect that corrections will be required in initial models. In this chapter, a theory is given for making such corrections with machine assistance.

Chapter 8, titled "The Process of Structural Modeling", seeks to summarize concisely the material presented in Chapters 4-6 from a process point of view.

Chapter 9, titled "Constructing Operational Value Systems for Proposed Two-Unit Coalitions", illustrates one possible type of application of structural modeling. Also, it shows how the theory can be applied even when one of the contextual relations is not transitive.

The Appendix is a statement and proof of the "bordering theorem" that is applied developing the process and the correction theory.