Contents

PREFACE xi

1 WHY INFORMATION MODELING? 1

Difficulties in software development. 1 How projects go awry. 4 Information modeling as an answer. 6 When to use information modeling in the software development process. 7 Preview. 7

2 BASIC IDEAS 9

A quick intuitive introduction to the elements of the model.

3 OBJECTS 14

Definition of object. 14 Identifying objects. 15 Object descriptions. 19 Naming objects. 21 Testing objects. 23

4 ATTRIBUTES 26

Definition of attributes. 26 Notation. 28 Finding and classifying attributes. 29 Identifiers. 32 Attribute descriptions. 35 Domains. 37 Formalizing he concept of table. 40

5 RELATIONSHIPS 47

Concept of a relationship. 47 Forms of binary relationships. 49 Unconditional one-to-one relationships. 51 Unconditional one-to-many relationships. 53 Unconditional many-to-many relationships. 56 Semantics and modeling of conditional forms. 59

6 CONSTRUCTIONS INVOLVING MANY OBJECTS 65

Subtypes and supertypes. 65 Associative objects. 69

7 REPRESENTATION OF THE INFORMATION MODEL 76

Information structure diagrams. 77 Overview information structure diagram. 81 Object specification document. 83 Relationship specification document. 84 Summary document. 84

8 TECHNIQUES 86

Document research. 86 Dialog. 87 Technical notes. 89 Reviews. 89 Other suggestions. 89

9 THE ROLE OF THE INFORMATION MODEL IN SYSTEM DEVELOPMENT. 91

Software development processes. 92 The analysis phase: An object-oriented approach. 93 The external specification phase. 97 The system design phase. 102 The implementation phase. 105 Summary. 108 Appendix A: INFORMATION MODEL FOR MANAGEMENT OF

MAGNETIC TAPES 109

Appendix B: DATA ORGANIZATION FOR A REAL-TIME.

PROCESS CONTROL SYSTEM 131

Appendix C: REFERENCES 139

INDEX 141