Chapter 4: Describing Structured Data  
Networks and Graphs 33  
Brief Introduction to Graphs 35  
Relational Modeling 37  
Relational Concepts 38  
Cardinality and Entity-Relationship Diagrams 39  
Normalization 40  
Impact of Time and Date on Relational Models 49  
Applying Graph Theory to Data Models 51  
Directed Graphs 52  
Normalized Models 53  
Note 54  

Chapter 5: Small Worlds Business Measure of Data  
Small Worlds 55  
Measuring the Problem and Solution 56  
Abstracting Information as a Graph 57  
Metrics 58  
Interpreting the Results 60  
Navigating the Information Graph 61  
Information Relationships Quickly Get Complex 62  
Using the Technique 64  
Note 65  

Chapter 6: Measuring the Quantity of Information  
Definition of Information 66  
Thermal Entropy 67  
Information Entropy 68  
Entropy versus Storage 70  
Enterprise Information Entropy 73  
Decision Entropy 76  
Conclusion and Application 78  
Notes 78  

Chapter 7: Describing the Enterprise  
Size of the Undertaking 79  
Enterprise Data Models Are All or Nothing 80  
The Data Model as a Panacea 81  
Metadata 82  
The Metadata Solution 83
## Chapter 11: Layered View of Information

- Information Layers 136
- Are They Real? 137
- Turning the Layers into an Architecture 141
- The User Interface 143
- Selling the Architecture 144

## Chapter 12: Master Data Management

- Publish and Subscribe 146
- About Time 148
- Granularity, Terminology, and Hierarchies 148
- Rule 1: Consistent Terminology 149
- Rule 2: Everyone Owns the Hierarchies 150
- Rule 3: Consistent Granularity 150
- Reconciling Inconsistencies 151
- Slowly Changing Dimensions 151
- Customer Data Integration 153
- Extending the Metadata Model 153
- Technology 155

## Chapter 13: Information and Data Quality

- Spreadsheets 156
- Referencing 157
- Fit for Purpose 158
- Measuring Structured Data Quality 160
- A Scorecard 164
- Metadata Quality 164
- Extended Metadata Model 165
- Notes 166

## Chapter 14: Security

- Cryptography 167
- Public Key Cryptography 169
- Applying PKI 170
- Predicting the Unpredictable 172
- Protecting an Individual’s Right to Privacy 172
- Securing the Content versus Securing the Reference 175
Chapter 15: Opening Up to the Crowd 176

A Taxonomy for the Future 177
Populating the Stakeholder Attributes 179
Reducing E-mail Traffic within Projects 179
Managing Customer E-mail 180
General E-mail 180
Preparing for the Unknown 181
Third-Party Data Charters 182
Information Is Dynamic 183
Power of the Crowd Can Improve Your Data Quality 183
Note 184

Chapter 16: Building Incremental Knowledge 185

Bayesian Probabilities 187
Information from Processes 188
The MIT Beer Game 192
Hypothesis Testing and Confidence Levels 193
Business Activity Monitoring 195
Note 196

Chapter 17: Enterprise Information Architecture 197

Web Site Information Architecture 198
Extending the Information Architecture 198
Business Context 199
Users 199
Content 200
Top-Down/Bottom-Up 200
Presentation Format 201
Project Resourcing 201
Information to Support Decision Making 203
Notes 204

Looking to the Future 205

About the Author 209

Index 211