Contents

Preface xi

1 **The Sorcerer's Apprentice** 1
Example: Designing a Multimedia System 2
Guiding and Coordinating Discovery 6
Example: Designing a Library System 8
Identifying the Real Problem 11
Thriving on Design 13

2 **What Is Design?** 19
Clarifying the Problem 22
Identifying Design Moves 26
Envisioning the Solution 29
Recognizing Trade-offs and Dependencies 34
Integrating Diverse Knowledge and Skill 37
Anticipating Impacts on Human Activity 39
Design Is Hard 42

3 **Scenario-Based Design** 45
What Are Scenarios? 46
Challenge: Design Action Competes with Reflection 48
Scenarios Evoke Reflection in Design 50
Challenge: Design Situations Are Fluid 52
Scenarios Are at Once Concrete and Flexible 54
Challenge: External Factors Constrain Design 55
Scenarios Promote Work Orientation 57
Challenge: Design Moves Have Many Consequences 58
Scenarios Have Many Views 60

Challenge: Technical Knowledge Lags Design 63
Scenarios Can Be Abstracted and Categorized 64
Toward a Scenario-Based Framework for Design 67

4 **Example: Video Information System 71**
Raison d'Etre 72
Clarifying Design Concerns and Objectives 76
Envisioning Alternative Situations 79
Managing Consequences and Trade-offs 86
Creating and Using Design Knowledge 92
Staying Focused on People and Use 96

5 **Example: Programming Tutorial and Tools 101**
Design Context 102
Design Analysis 106
Envisionment: Bittitalk Browser 108
Envisionment: View Matcher 113
Development: MiTTS 117
Deployment and Evaluation 121

6 **Usability Rationale 125**
Claims and Requirements for the Touchstone Scenario 127
Designing and Analyzing a New Touchstone Scenario 131
Identifying Appropriate Goals 136
Sustained Learning 142
Consequences for Work Groups 150
The Place of Claims Analysis in Scenario-Based Design 154

7 **Cumulative Design 159**
A View Matcher for Reuse 161
Principled Emulation of a View Matcher 166
Activity Modeling in the MoleHill Guru 175
Genre Specialization in the MoleHill Goalposter 181
Envisioning and Refining the Goalposter 187
Design Patterns and Design Models 192

8 **Evaluation and Theory Building 195**
Evaluation Goals and Methods 196
Evaluating and Developing Design Genres 200
Attributions to Multiple Theories 205

Remote and Distributed Causes 212
Thread-Level Claims 217
Evaluation-Driven Design 224

9 **Software Development 229**
Object-Oriented Software 229
Responsibility-Driven Design 234
Developing Object Models from Scenarios 237
The Scenario Browser 245
The Specification-Implementation Gap 251

10 **Finding Scenarios and Making Claims 255**
Where Do Scenarios Come From? 255
How to Make Claims 271
Managing Scenarios and Claims 283

11 **Getting Around the Task-Artifact Cycle 287**
Scenario-Based System Development 287
MiTTS Again 292
Requirements Development in LiNC 297
Toward a Scenario-Based Methodology 309

12 **The Scenario Dilemma 315**
Some Status on Scenario-Based Design 316
Challenges for the Future 322
No More Sorcerers 328

References 331
Index 351