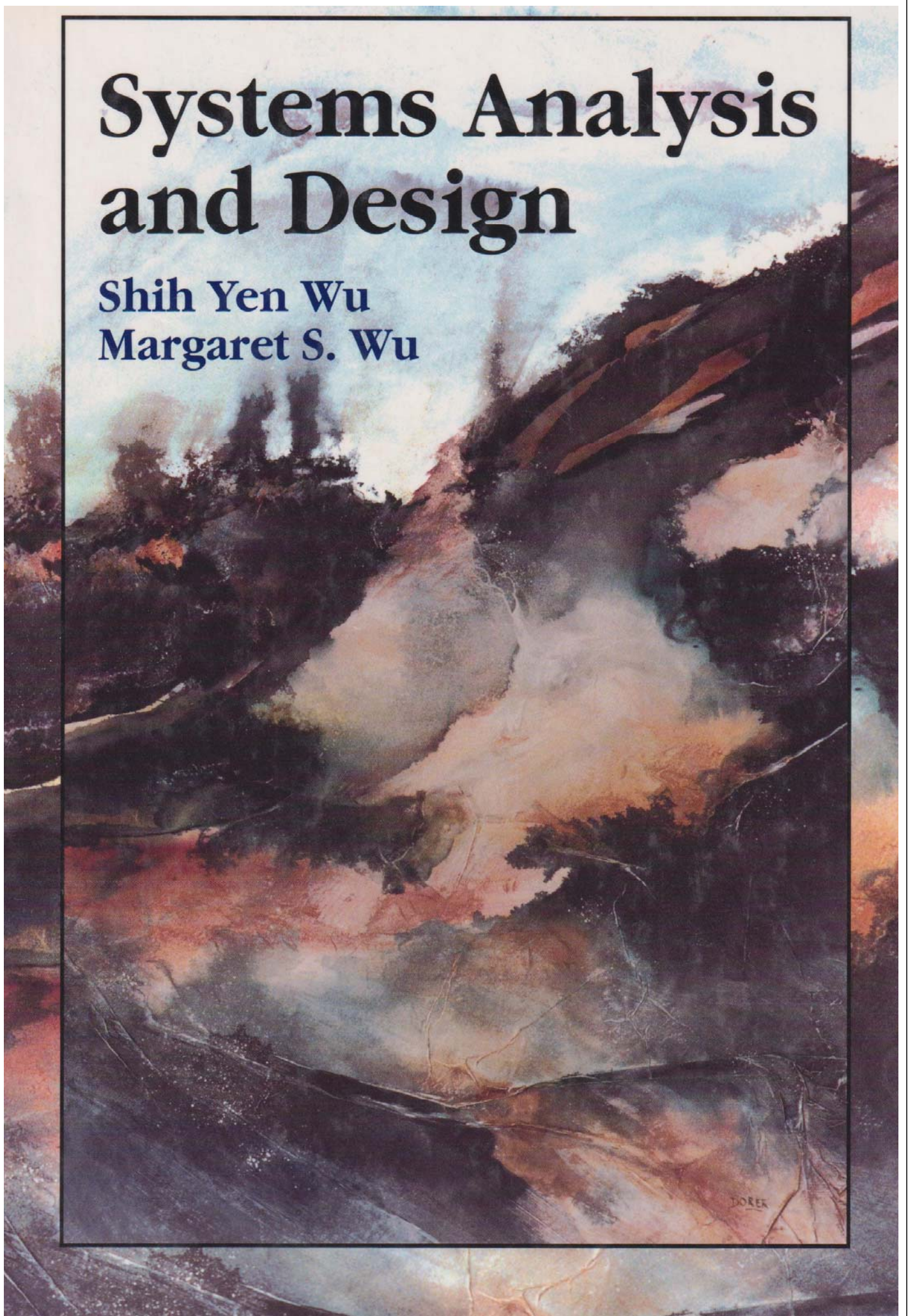


Systems Analysis and Design

Shih Yen Wu
Margaret S. Wu



Contents in Brief

Preface xiii

PART I

An Overview of Systems Analysis and Design 1

Chapter 1 Systems Analysis and Design: An Introduction 3

Chapter 2 Alternatives to the Systems Development Life Cycle 43

PART II

The Preliminary Investigation and Analysis Phases 79

Chapter 3 Discovering the Problem's Solution 81

Chapter 4 Cost/Benefit Analysis 111

Chapter 5 Project Management 141

Chapter 6 Information Gathering 183

PART III

Two Real-World Projects 213

Chapter 7 A Case Study: The Campus Bookstore 215

Chapter 8 A Case Study: A Small Business System 251

PART IV

The Modeling Tools of Systems Analysis 293

Chapter 9 Data Flow Diagrams 295

Chapter 10 The Data Dictionary 331

Chapter 11 Process Descriptions 363

PART V

The Design Phase 393

Chapter 12 The Logical Representation of the Data: Two Models 395

Chapter 13 Design of Physical Files 443

Chapter 14 Design Principles and Output Design 487

Chapter 15 Input Design 523

Chapter 16 Hardware Selection and Program Design 563

PART VI

The Implementation, Installation, and Post-Implementation Review Phases 607

Chapter 17 The Final Phases of the Life Cycle 609

Index 661

Contents

Preface xiii

PART I

An Overview of Systems Analysis and Design 1

Chapter 1 Systems Analysis and Design: An Introduction 3

- The Systems Approach to Problem Solving 8
- The Systems Development Life Cycle 13
- Alternatives to the Traditional SDLC 26
- The Job of the Systems Analyst 30
- Acquiring the Techniques of the Systems Analyst 35

Chapter 2 Alternatives to the Systems Development Life Cycle 43

- Software Application Packages 45
- Prototyping 51
- Reusable Code 56
- CASE Tools 58
- Reverse Engineering 64
- Object-Oriented Methodology 66
- End-User Development 69

PART II

The Preliminary Investigation and Analysis Phases 79

Chapter 3 Discovering the Problem's Solution 81

- Fundamental Principles of Systems Analysis 83
- The Preliminary Investigation Phase 86
- The Analysis Phase 102

Chapter 4 Cost/Benefit Analysis 111

- Why Perform a Cost/Benefit Analysis? 112
- Cost Analysis 113
- Benefit Analysis 117
- Intangible Costs and Benefits 118
- Comparison of Costs and Benefits 121

Chapter 5	Project Management	141
	What is Project Management?	142
	The Tools of Project Management	143
	The Role of the SDLC in Project Planning	157
	Software Cost Estimation	160
	Software Management Structures	172

Chapter 6	Information Gathering	183
	Understanding the Users	185
	Methods of Information Gathering	188
	Interviewing	189
	Questionnaires	200
	Observation	203
	Work Sampling	204
	Joint Application Design	205

PART III

Two Real-World Projects 213

Chapter 7	A Case Study: The Campus Bookstore	215
	The Bookstore's Problems	216
	The Initial Definition of the Problem	218
	The Feasibility Study	220
	The Analysis Phase	239
	The Design Phase	240
	The Implementation Phase	241
	The Installation Phase	242
	The Post-Implementation Review	244
Chapter 8	A Case Study: A Small Business System	251
	Dr. Washington's Office	252
	The Preliminary Investigation	254
	Analysis	272
	Designing the System	275
	The Implementation Phase	281
	Installing the New System	285
	The Post-Implementation Review	285

PART IV

The Modeling Tools of Systems Analysis 293

Chapter 9	Data Flow Diagrams	295
	The Components of Information Systems	297
	The Hierarchy of Data Flow Diagrams	306

Rules of the Game	311
Physical Versus Logical DFDs	318
Modeling the Proposed System	322

Chapter 10 The Data Dictionary 331

The Reasons for a Data Dictionary	332
The Components of the Data Dictionary	333
Data Records	336
Data Elements	341
Data Stores	346
Code Tables	347
Preparing the Data Dictionary	348
The Description of Real-World Data	349

Chapter 11 Process Descriptions 363

Policies and Procedures	364
General Rules for Process Descriptions	365
Structured English	367
Decision Tables	377
Decision Trees	383
Which Technique to Use for a Process?	385
Process Descriptions in Excelerator	387

PART V

The Design Phase 393

Chapter 12 The Logical Representation of the Data: Two Models 395

The Relational Model	397
The Entity-Relationship Diagram	409
Seven Steps to Normalization	414

Chapter 13 Design of Physical Files 443

Technical Concepts	445
Ten Steps for Physical File Design	459

Chapter 14 Design Principles and Output Design 487

What is Good Input/Output Design?	488
Humans vs. Computers	490
Principles of Good Design	493
Output Design in Eight Steps	496

Chapter 15 Input Design 523

Input Design in Eight Steps	524
Human-Computer Dialogues	543

Chapter 16 Hardware Selection and Program Design 563

Selection of Hardware and Software 565

Designing the Programs 577

PART VI

**The Implementation, Installation, and
Post-Implementation Review Phases 607**

Chapter 17 The Final Phases of the Life Cycle 609

The Implementation Phase 612

Software Quality 637

The Software Quality Assurance Program 639

The Installation Phase 643

The Post-Implementation Review Phase 650

Index 661