图书基本信息

书名:《软件工程》

13位ISBN编号:9787111341963

10位ISBN编号:7111341961

出版时间:2011-6

出版社:机械工业出版社

作者: (美) Stephen R. Schach

页数:667

版权说明:本站所提供下载的PDF图书仅提供预览和简介以及在线试读,请支持正版图书。

更多资源请访问:www.tushu000.com

内容概要

本书对软件工程的基础知识(包括面向对象和传统方法)进行了严谨和全面的介绍,是软件工程领域的经典著作。

全书共分两大部分:第一部分介绍基本的软件工程理论;第二部分讲述更实用的软件生命周期。作者采用这种独特的、极具可读性的组织方式,帮助学生和广大读者理解软件工程中的一些复杂概念。最新版第8版对全书进行了整体更新,新增两章内容,分别概括介绍软件工程的关键知识点和近年涌现的新技术。

本版新增内容如下:

新增两章内容:第10章总结第一部分涉及的关键知识点,便于学生在做团队项目时参考使用;第18章概括介绍10种新技术,分别是面向方面的技术、模型驱动技术、基于组件的技术、面向服务的技术、社交计算、Web工程、云技术、Web 3.0和模型检测。

扩展设计模式的相关材料,新增一个小的案例。 新增两个理论工具,即分而治之和关注点分离。 新增100多道习题,并更新了大量参考文献。

《软件丁程》

作者简介

Stephen R. Schach 1972年获魏兹曼科学院物理学理科硕士学位,1973年获开普敦大学应用数学博士学位,目前是美国范德比尔特大学计算机科学和计算机工程名誉教授。他的研究兴趣主要集中在软件工程领域,特别是对软件维护与开源软件的实验分析有深入研究。他著有多部软件工程、面向对象系统分析与设计方面的教材。

书籍目录

Preface iv

Chapter 1

The Scope of Software Engineering 1

Learning Objectives 1

- 1.1 Historical Aspects 2
- 1.2 Economic Aspects 5
- 1.3 Maintenance Aspects 6
- 1.3.1 Classical and Modern Views

of Maintenance 9

- 1.3.2 The Importance of Postdelivery Maintenance 10
- 1.4 Requirements, Analysis, and Design Aspects 12
- 1.5 Team Development Aspects 15
- 1.6 Why There Is No Planning Phase 16
- 1.7 Why There Is No Testing Phase 16
- 1.8 Why There Is No Documentation Phase 17
- 1.9 The Object-Oriented Paradigm 18
- 1.10 The Object-Oriented Paradigm in Perspective 22
- 1.11 Terminology 23
- 1.12 Ethical Issues 26

Chapter Review 27

For Further Reading 27

Key Terms 28

Problems 29

References 30

PART A

SOFTWARE ENGINEERING CONCEPTS 35

Chapter 2

Software Life-Cycle Models 37

Learning Objectives 37

- 2.1 Software Development in Theory 37
- 2.2 Winburg Mini Case Study 38
- 2.3 Lessons of the Winburg Mini Case Study 42
- 2.4 Teal Tractors Mini Case Study 42
- 2.5 Iteration and Incrementation 43
- 2.6 Winburg Mini Case Study Revisited 47
- 2.7 Risks and Other Aspects of Iteration and Incrementation 48
- 2.8 Managing Iteration and

Incrementation 51

- 2.9 Other Life-Cycle Models 52
- 2.9.1 Code-and-Fix Life-Cycle Model 52
- 2.9.2 Waterfall Life-Cycle Model 53
- 2.9.3 Rapid-Prototyping Life-Cycle Model 55
- 2.9.4 Open-Source Life-Cycle Model 56
- 2.9.5 Agile Processes 59
- 2.9.6 Synchronize-and-Stabilize Life-Cycle Model 62
- 2.9.7 Spiral Life-Cycle Model 62
- 2.10 Comparison of Life-Cycle Models 66

Chapter Review 67

For Further Reading 68

Key Terms 69

Problems 69

References 70

Chapter 3

The Software Process 74

Learning Objectives 74

3.1 The Unified Process 76

3.2 Iteration and Incrementation

within the Object-Oriented Paradigm 76

3.3 The Requirements Workfl ow 78

3.4 The Analysis Workfl ow 80

3.5 The Design Workfl ow 82

3.6 The Implementation Workfl ow 83

3.7 The Test Workfl ow 84

3.7.1 Requirements Artifacts 84

3.7.2 Analysis Artifacts 84

3.7.3 Design Artifacts 85

3.7.4 Implementation Artifacts 85

3.8 Postdelivery Maintenance 87

3.9 Retirement 88

3.10 The Phases of the Unified Process 88

3.10.1 The Inception Phase 89

3.10.2 The Elaboration Phase 91

3.10.3 The Construction Phase 92

3.10.4 The Transition Phase 92

3.11 One- versus Two-Dimensional Life-Cycle Models 92

3.12 Improving the Software Process 94

3.13 Capability Maturity Models 95

3.14 Other Software Process Improvement Initiatives 98

3.15 Costs and Benefi ts of Software Process Improvement 99

Chapter Review 101

For Further Reading 102

Key Terms 102

Problems 103

References 104

Chapter 4

Teams 107

Learning Objectives 107

4.1 Team Organization 107

4.2 Democratic Team Approach 109

4.2.1 Analysis of the Democratic Team Approach 110

4.3 Classical Chief Programmer Team Approach 110

4.3.1 The New York Times Project 112

4.3.2 Impracticality of the Classical Chief Programmer Team Approach 113

4.4 Beyond Chief Programmer and Democratic Teams 113

4.5 Synchronize-and-Stabilize Teams 117

4.6 Teams for Agile Processes 118

- 4.7 Open-Source Programming Teams 118
- 4.8 People Capability Maturity Model 119
- 4.9 Choosing an Appropriate Team Organization 120

Chapter Review 121

For Further Reading 121

Key Terms 122

Problems 122

References 122

Chapter 5

The Tools of the Trade 124

Learning Objectives 124

- 5.1 Stepwise Refi nement 124
- 5.1.1 Stepwise Refi nement Mini Case Study 125
- 5.2 Cost Benefi t Analysis 130
- 5.3 Divide-and-Conquer 132
- 5.4 Separation of Concerns 132
- 5.5 Software Metrics 133
- 5.6 CASE 134
- 5.7 Taxonomy of CASE 135
- 5.8 Scope of CASE 137
- 5.9 Software Versions 141
- 5.9.1 Revisions 141
- 5.9.2 Variations 142
- 5.10 Confi guration Control 143
- 5.10.1 Confi guration Control during Postdelivery Maintenance 145
- 5.10.2 Baselines 145
- 5.10.3 Confi guration Control during Development 146
- 5.11 Build Tools 146
- 5.12 Productivity Gains with CASE Technology 147

Chapter Review 149

For Further Reading 149

Key Terms 150

Problems 150

References 151

Chapter 6

Testing 154

- 6.1 Quality Issues 155
- 6.1.1 Software Quality Assurance 156
- 6.1.2 Managerial Independence 156
- 6.2 Non-Execution-Based Testing 157
- 6.2.1 Walkthroughs 158
- 6.2.2 Managing Walkthroughs 158
- 6.2.3 Inspections 159
- 6.2.4 Comparison of Inspections and Walkthroughs 161
- 6.2.5 Strengths and Weaknesses of Reviews 162
- 6.2.6 Metrics for Inspections 162
- 6.3 Execution-Based Testing 162
- 6.4 What Should Be Tested? 163

- 6.4.1 Utility 164
- 6.4.2 Reliability 164
- 6.4.3 Robustness 165
- 6.4.4 Performance 165
- 6.4.5 Correctness 166
- 6.5 Testing versus Correctness Proofs 167
- 6.5.1 Example of a Correctness Proof 167
- 6.5.2 Correctness Proof Mini Case Study 171
- 6.5.3 Correctness Proofs and Software Engineering 172
- 6.6 Who Should Perform Execution-Based Testing? 175
- 6.7 When Testing Stops 176

Chapter Review 176

For Further Reading 177

Key Terms 177

Problems 178

References 179

Chapter 7

From Modules to Objects 183

Learning Objectives 183

- 7.1 What Is a Module? 183
- 7.2 Cohesion 187
- 7.2.1 Coincidental Cohesion 187
- 7.2.2 Logical Cohesion 188
- 7.2.3 Temporal Cohesion 189
- 7.2.4 Procedural Cohesion 189
- 7.2.5 Communicational Cohesion 190
- 7.2.6 Functional Cohesion 190
- 7.2.7 Informational Cohesion 191
- 7.2.8 Cohesion Example 191
- 7.3 Coupling 192
- 7.3.1 Content Coupling 192
- 7.3.2 Common Coupling 193
- 7.3.3 Control Coupling 195
- 7.3.4 Stamp Coupling 195
- 7.3.5 Data Coupling 196
- 7.3.6 Coupling Example 197
- 7.3.7 The Importance of Coupling 198
- 7.4 Data Encapsulation 199
- 7.4.1 Data Encapsulation and Development 201
- 7.4.2 Data Encapsulation and Maintenance 202
- 7.5 Abstract Data Types 207
- 7.6 Information Hiding 209
- 7.7 Objects 211
- 7.8 Inheritance, Polymorphism, and Dynamic Binding 215
- 7.9 The Object-Oriented Paradigm 217

Chapter Review 220

For Further Reading 221

Key Terms 221

Problems 221

R	Δĺ	fρi	rer	റ്റെ	222
11	C	\Box	U	1000	~~~

Chapter 8

Reusability and Portability 225

Learning Objectives 225

- 8.1 Reuse Concepts 226
- 8.2 Impediments to Reuse 228
- 8.3 Reuse Case Studies 229
- 8.3.1 Raytheon Missile Systems

Division 230

- 8.3.2 European Space Agency 231
- 8.4 Objects and Reuse 232
- 8.5 Reuse during Design and Implementation 232
- 8.5.1 Design Reuse 232
- 8.5.2 Application Frameworks 234
- 8.5.3 Design Patterns 235
- 8.5.4 Software Architecture 236
- 8.5.5 Component-Based Software Engineering 237
- 8.6 More on Design Patterns 237
- 8.6.1 FLIC Mini Case Study 238
- 8.6.2 Adapter Design Pattern 239
- 8.6.3 Bridge Design Pattern 240
- 8.6.4 Iterator Design Pattern 241
- 8.6.5 Abstract Factory Design Pattern 241
- 8.7 Categories of Design Patterns 245
- 8.8 Strengths and Weaknesses of Design Patterns 247
- 8.9 Reuse and the World Wide Web 248
- 8.10 Reuse and Postdelivery Maintenance 249
- 8.11 Portability 250
- 8.11.1 Hardware Incompatibilities 250
- 8.11.2 Operating System Incompatibilities 251
- 8.11.3 Numerical Software Incompatibilities 251
- 8.11.4 Compiler Incompatibilities 253
- 8.12 Why Portability? 255
- 8.13 Techniques for Achieving Portability 256
- 8.13.1 Portable System Software 257
- 8.13.2 Portable Application Software 257
- 8.13.3 Portable Data 258
- 8.13.4 Model-Driven Architecture 259

Chapter Review 259

For Further Reading 260

Key Terms 261

Problems 261

References 263

CHAPTER 9

Planning and Estimating 268

- 9.1 Planning and the Software Process 268
- 9.2 Estimating Duration and Cost 270
- 9.2.1 Metrics for the Size of a Product 272

- 9.2.2 Techniques of Cost Estimation 275
- 9.2.3 Intermediate COCOMO 278
- 9.2.4 COCOMO II 281
- 9.2.5 Tracking Duration and Cost Estimates 282
- 9.3 Components of a Software Project Management Plan 282
- 9.4 Software Project Management Plan Framework 284
- 9.5 IEEE Software Project Management Plan 286
- 9.6 Planning Testing 288
- 9.7 Planning Object-Oriented Projects 289
- 9.8 Training Requirements 290
- 9.9 Documentation Standards 291
- 9.10 CASE Tools for Planning and Estimating 292
- 9.11 Testing the Software Project Management Plan 292

Chapter Review 292

For Further Reading 292

Key Terms 293

Problems 294

References 295

PART B

THE WORKFLOWS OF THE

SOFTWARE LIFE CYCLE 299

Chapter 10

Key Material from Part A 301

Learning Objective 301

- 10.1 Software Development: Theory versus Practice 301
- 10.2 Iteration and Incrementation 302
- 10.3 The Unified Process 306
- 10.4 Workfl ow Overview 307
- 10.5 Teams 307
- 10.6 Cost Benefi t Analysis 308
- 10.7 Metrics 308
- 10.8 CASE 308
- 10.9 Versions and Confi gurations 309
- 10.10 Testing Terminology 309
- 10.11 Execution-Based and Non-Execution-Based Testing 309
- 10.12 Modularity 310
- 10.13 Reuse 310
- 10.14 Software Project Management Plan 310

Chapter Review 311

Key Terms 311

Problems 312

Chapter 11

Requirements 313

- 11.1 Determining What the Client Needs 313
- 11.2 Overview of the Requirements Workfl ow 314
- 11.3 Understanding the Domain 315
- 11.4 The Business Model 316
- 11.4.1 Interviewing 316

- 11.4.2 Other Techniques 317
- 11.4.3 Use Cases 318
- 11.5 Initial Requirements 319
- 11.6 Initial Understanding of the Domain: The MSG Foundation Case Study 320
- 11.7 Initial Business Model: The MSG Foundation Case Study 322
- 11.8 Initial Requirements: The MSG Foundation Case Study 326
- 11.9 Continuing the Requirements Workfl ow: The MSG Foundation Case Study 328
- 11.10 Revising the Requirements: The MSG Foundation Case Study 330
- 11.11 The Test Workfl ow: The MSG Foundation Case Study 338
- 11.12 The Classical Requirements Phase 347
- 11.13 Rapid Prototyping 348
- 11.14 Human Factors 349
- 11.15 Reusing the Rapid Prototype 351
- 11.16 CASE Tools for the Requirements Workfl ow 353
- 11.17 Metrics for the Requirements Workfl ow 353
- 11.18 Challenges of the Requirements Workfl ow 354

Chapter Review 355

For Further Reading 356

Key Terms 357

Case Study Key Terms 357

Problems 357

References 358

Chapter 12

Classical Analysis 360

Learning Objectives 360

- 12.1 The Specifi cation Document 360
- 12.2 Informal Specifi cations 362
- 12.2.1 Correctness Proof Mini Case Study Redux 363
- 12.3 Structured Systems Analysis 364
- 12.3.1 Sally 's Software Shop Mini Case Study 364
- 12.4 Structured Systems Analysis: The MSG Foundation Case Study 372
- 12.5 Other Semiformal Techniques 373
- 12.6 Entity-Relationship Modeling 374
- 12.7 Finite State Machines 376
- 12.7.1 Finite State Machines: The Elevator Problem Case Study 378
- 12.8 Petri Nets 382
- 12.8.1 Petri Nets: The Elevator Problem Case Study 385
- 12.9 Z 387
- 12.9.1 Z: The Elevator Problem Case Study 388
- 12.9.2 Analysis of Z 390
- 12.10 Other Formal Techniques 392
- 12.11 Comparison of Classical Analysis Techniques 392
- 12.12 Testing during Classical Analysis 393
- 12.13 CASE Tools for Classical Analysis 394
- 12.14 Metrics for Classical Analysis 395
- 12.15 Software Project Management Plan: The MSG Foundation Case Study 395
- 12.16 Challenges of Classical Analysis 396

Chapter Review 396

For Further Reading 397

Key Terms 398

Case Study Key Terms 398

Problems 398

References 400

Chapter 13

Object-Oriented Analysis 404

Learning Objectives 404

13.1 The Analysis Workfl ow 405

13.2 Extracting the Entity Classes 406

13.3 Object-Oriented Analysis: The Elevator Problem Case Study 407

13.4 Functional Modeling: The Elevator Problem Case Study 407

13.5 Entity Class Modeling: The Elevator Problem Case Study 410

13.5.1 Noun Extraction 411

13.5.2 CRC Cards 413

13.6 Dynamic Modeling: The Elevator Problem Case Study 414

13.7 The Test Workfl ow: Object-Oriented Analysis 417

13.8 Extracting the Boundary and Control Classes 424

13.9 The Initial Functional Model: The MSG Foundation Case Study 425

13.10 The Initial Class Diagram: The MSG Foundation Case Study 428

13.11 The Initial Dynamic Model: The MSG Foundation Case Study 430

13.12 Revising the Entity Classes: The MSG Foundation Case Study 432

13.13 Extracting the Boundary Classes: The MSG Foundation Case Study 434

13.14 Extracting the Control Classes: The MSG Foundation Case Study 435

13.15 Use-Case Realization: The MSG Foundation Case Study 435

13.15.1 Estimate Funds Available for Week Use Case 436

13.15.2 Manage an Asset Use Case 442

13.15.3 Update Estimated Annual Operating Expenses Use Case 446

13.15.4 Produce a Report Use Case 449

13.16 Incrementing the Class Diagram: The MSG Foundation Case Study 454

13.17 The Test Workfl ow: The MSG Foundation Case Study 456

13.18 The Specification Document in the Unified Process 456

13.19 More on Actors and Use Cases 457

13.20 CASE Tools for the Object-Oriented Analysis Workfl ow 458

13.21 Metrics for the Object-Oriented Analysis Workfl ow 459

13.22 Challenges of the Object-Oriented Analysis Workfl ow 459

Chapter Review 460

For Further Reading 461

Key Terms 462

Problems 462

References 463

Chapter 14

Design 465

Learning Objectives 465

14.1 Design and Abstraction 466

14.2 Operation-Oriented Design 466

14.3 Data Flow Analysis 467

14.3.1 Mini Case Study Word Counting 468

14.3.2 Data Flow Analysis Extensions 473

14.4 Transaction Analysis 473

- 14.5 Data-Oriented Design 475
- 14.6 Object-Oriented Design 476
- 14.7 Object-Oriented Design: The Elevator Problem Case Study 477
- 14.8 Object-Oriented Design: The MSG Foundation Case Study 481
- 14.9 The Design Workfl ow 483
- 14.10 The Test Workfl ow: Design 487
- 14.11 The Test Workfl ow: The MSG Foundation Case Study 488
- 14.12 Formal Techniques for Detailed Design 488
- 14.13 Real-Time Design Techniques 488
- 14.14 CASE Tools for Design 490
- 14.15 Metrics for Design 490
- 14.16 Challenges of the Design Workfl ow 491

Chapter Review 492

For Further Reading 493

Key Terms 493

Problems 494

References 495

Chapter 15

Implementation 498

- 15.1 Choice of Programming Language 498
- 15.2 Fourth-Generation Languages 501
- 15.3 Good Programming Practice 504
- 15.3.1 Use of Consistent and Meaningful Variable Names 504
- 15.3.2 The Issue of Self-Documenting Code 505
- 15.3.3 Use of Parameters 507
- 15.3.4 Code Layout for Increased Readability 507
- 15.3.5 Nested if Statements 507
- 15.4 Coding Standards 509
- 15.5 Code Reuse 510
- 15.6 Integration 510
- 15.6.1 Top-down Integration 511
- 15.6.2 Bottom-up Integration 513
- 15.6.3 Sandwich Integration 513
- 15.6.4 Integration of Object-Oriented Products 514
- 15.6.5 Management of Integration 515
- 15.7 The Implementation Workfl ow 516
- 15.8 The Implementation Workflow: The MSG Foundation Case Study 516
- 15.9 The Test Workfl ow: Implementation 516
- 15.10 Test Case Selection 517
- 15.10.1 Testing to Specifications versus Testing to Code 517
- 15.10.2 Feasibility of Testing to Specifi cations 517
- 15.10.3 Feasibility of Testing to Code 518
- 15.11 Black-Box Unit-Testing Techniques 520
- 15.11.1 Equivalence Testing and Boundary Value Analysis 521
- 15.11.2 Functional Testing 522
- 15.12 Black-Box Test Cases: The MSG Foundation Case Study 523
- 15.13 Glass-Box Unit-Testing Techniques 525
- 15.13.1 Structural Testing: Statement, Branch, and Path Coverage 526

- 15.13.2 Complexity Metrics 527
- 15.14 Code Walkthroughs and Inspections 528
- 15.15 Comparison of Unit-Testing Techniques 528
- 15.16 Cleanroom 529
- 15.17 Potential Problems When Testing Objects 530
- 15.18 Management Aspects of Unit Testing 533
- 15.19 When to Reimplement Rather than Debug a Code Artifact 533
- 15.20 Integration Testing 535
- 15.21 Product Testing 535
- 15.22 Acceptance Testing 536
- 15.23 The Test Workfl ow: The MSG Foundation Case Study 537
- 15.24 CASE Tools for Implementation 537
- 15.24.1 CASE Tools for the Complete Software Process 538
- 15.24.2 Integrated Development Environments 538
- 15.24.3 Environments for Business Applications 539
- 15.24.4 Public Tool Infrastructures 540
- 15.24.5 Potential Problems with Environments 540
- 15.25 CASE Tools for the Test Workfl ow 540
- 15.26 Metrics for the Implementation Workfl ow 541
- 15.27 Challenges of the Implementation Workfl ow 542

Chapter Review 542

For Further Reading 543

Key Terms 544

Problems 545

References 547

Chapter 16

Postdelivery Maintenance 551

Learning Objectives 551

- 16.1 Development and Maintenance 551
- 16.2 Why Postdelivery Maintenance Is Necessary 553
- 16.3 What Is Required of Postdelivery Maintenance Programmers? 553
- 16.4 Postdelivery Maintenance Mini Case Study 555
- 16.5 Management of Postdelivery Maintenance 557
- 16.5.1 Defect Reports 557
- 16.5.2 Authorizing Changes to the Product 558
- 16.5.3 Ensuring Maintainability 559
- 16.5.4 Problem of Repeated Maintenance 559
- 16.6 Maintenance of Object-Oriented Software 560
- 16.7 Postdelivery Maintenance Skills versus

Development Skills 563

- 16.8 Reverse Engineering 563
- 16.9 Testing during Postdelivery Maintenance 564
- 16.10 CASE Tools for Postdelivery Maintenance 565
- 16.11 Metrics for Postdelivery Maintenance 566
- 16.12 Postdelivery Maintenance: The MSG Foundation Case Study 566
- 16.13 Challenges of Postdelivery Maintenance 566

Chapter Review 566

For Further Reading 567

Key Terms 567

Problems 567

References 568

Chapter 17

More on UML 571

Learning Objectives 571

17.1 UML Is Not a Methodology 571

17.2 Class Diagrams 572

17.2.1 Aggregation 573

17.2.2 Multiplicity 574

17.2.3 Composition 575

17.2.4 Generalization 576

17.2.5 Association 576

17.3 Notes 577

17.4 Use-Case Diagrams 577

17.5 Stereotypes 577

17.6 Interaction Diagrams 579

17.7 Statecharts 581

17.8 Activity Diagrams 583

17.9 Packages 585

17.10 Component Diagrams 586

17.11 Deployment Diagrams 586

17.12 Review of UML Diagrams 587

17.13 UML and Iteration 587

Chapter Review 587

For Further Reading 588

Key Terms 588

Problems 588

References 589

Chapter 18

Emerging Technologies 590

Learning Objectives 590

18.1 Aspect-Oriented Technology 591

18.2 Model-Driven Technology 593

18.3 Component-Based Technology 594

18.4 Service-Oriented Technology 594

18.5 Comparison of Service-Oriented and Component-Based Technology 595

18.6 Social Computing 596

18.7 Web Engineering 596

18.8 Cloud Technology 597

18.9 Web 3.0 598

18.10 Computer Security 598

18.11 Model Checking 598

18.12 Present and Future 599

Chapter Review 599

For Further Reading 599

Key Terms 599

References 600

Bibliography 601

Appendix A

Term Project: Chocoholics Anonymous 627

Appendix B

Software Engineering Resources 630

Appendix C

Requirements Workfl ow: The MSG Foundation Case Study 632

Appendix D

Structured Systems Analysis: The MSG Foundation Case Study 633

Appendix E

Analysis Workfl ow: The MSG Foundation Case Study 636

Appendix F

Software Project Management Plan: The MSG Foundation Case Study 637

Appendix G

Design Workfl ow: The MSG Foundation Case Study 642

Appendix H

Implementation Workfl ow: The MSG Foundation Case Study (C++ Version) 647

Appendix I

Implementation Workfl ow: The MSG Foundation Case Study (Java Version) 648

Appendix J

Test Workfl ow: The MSG Foundation Case Study 649

Author Index 651 Subject Index 654

章节摘录

版权页:插图:A word used on almost every page of this book is software. Software consists of not just code in machine-readable form but also all the documentation that is an intrinsic com- ponent of every project. Software includes the specification document, the design docu-ment, legal and accounting documents of all kinds, the software project management plan, and other management documents as well as all types of manuals. Since the 1970s, the difference between a program and a system has become blurred. In the "good old days;" the distinction was clear. A program was an autonomous piece of code, generally in the form of a deck of punched cards that could be executed. A system was a related collection of programs. A system might consist of programs P, Q, R, and S. Magnetic tape Twas mounted, and then program Pwas run. It caused a deck of data cards to be read in and produced as output tapes T2 and Ta. Tape T2 then was rewound, and pro- gram Q was run, producing tape T4 as output. Program R now merged tapes Ta and T4 into tape Ts; Ts served as input for program S, which printed a series of reports. Compare that situation with a product, running on a machine with a front-end com- munications processor and a back-end database manager, that performs real-time control of a steel mill. The single piece of software contro! ling the steel mill does far more than the old-fashioned system, but in terms of the classic definitions of program and system, this software undoubtedly is a program. To add to the confusion, the term system now is also used to denote the hardware-software combination. For example, the flight control system in an aircraft consists of both the in-flight computers and the software running on them. Depending on who is using the term, the flight control system also may include the controls, such as the joystick, that send commands to the computer and the parts of the aircraft, such as the wing flaps, controlled by the computer. Furthermore, within the context of traditional software development, the term systems analysis refers to the first two phases (requirements and analysis phases) and systems design refers to the third phase (design phase). To minimize confusion, this book uses the term product to denote a nontrivial piece of software. There are two reasons' for this convention. The first is simply to obviate the pro- gram versus system confusion by using a third term. The second reason is more important. This book deals with the process of software production, that is, the way we produce soft- ware, and the end result of a process is termed a product. Finally, the term system is used in its modem sense, that is, the combined hardware and software, or as part of universally accepted phrases, such as operating system and management information system. Two words widely used within the context of software engineering are methodology and paradigm. In the 1970s, the word methodology began to be used in the sense of "a way of developing a software product"; the word actually means the "science of meth- ods."

编辑推荐

《软件丁程》

精彩短评

- 1、没什么优缺点可说的!
- 2、这本书是学校要求我们买的教材,比学校的价格优惠,但是优惠力度还不够喔,希望以后亚马逊加大力度搞活动啦
- 3、应该是高仿 纸质比我同学从学校买的正版的略差

版权说明

本站所提供下载的PDF图书仅提供预览和简介,请支持正版图书。

更多资源请访问:www.tushu000.com