

Contents

	Preface	<i>xix</i>
	Audience	<i>xxi</i>
	Structure	<i>xxi</i>
	The Web Site	<i>xxv</i>
	References	<i>xxv</i>
	Acknowledgments	<i>xxvii</i>
Part I	The Risk-Based Testing Approach	1
1	Introduction to Risk-Based Testing	3
	Risky Project Foundations	3
	<i>Pressures on Testing and Quality Assurance</i>	5
	<i>The Tester's Manifesto</i>	6
	<i>Textbook Testing and the Real World</i>	7
	<i>The Risks of Early Release</i>	9
	What Is Risk?	11
	<i>Are Risks Wrong?</i>	11
	The Definition of Risk	12

	<i>Influences on Our Understanding of Risk</i>	13
	<i>The Definition of Risk We Use in This Book</i>	14
	Product Risk and Testing	16
	<i>What Is a Product?</i>	17
	<i>What Is Testing?</i>	18
	References	19
2	<u>Risk Management and Testing</u>	21
	Risk Workshops	22
	Risk Identification	23
	Risk Analysis	25
	<i>Assessing Consequence</i>	25
	<i>Assessing Probability</i>	27
	<i>Do Risk Numbers Mean Anything?</i>	30
	<i>Risk Exposure</i>	31
	Risk Response Planning	31
	<i>Information Buying and Testing</i>	32
	<i>Process Model and Testing</i>	33
	Risk Resolution and Monitoring	34
	Summary of Testing's Risk Management Role	34
	References	35
3	<u>Risk: A Better Language for Software Testing</u>	37
	Difficult Questions for Testers	38
	How Much Testing Is Enough (To Plan)?	39
	When Should We Stop Testing?	42
	When Is the Product Good Enough?	43
	<i>Who Decides?</i>	45
	The Classic Squeeze on Testing	47
	How Good Is Your Testing?	47

	A Definition of Good Testing	49
	References	50
4	Risk-Based Test Strategy	51
	From Risks to Test Objectives	52
	<i>Risks, Test Objectives, and Coverage</i>	54
	<i>The W-Model Extends the V-Model of Testing</i>	56
	Master Test Planning	60
	<i>Failure Mode and Effects Analysis</i>	60
	<i>The Risk-Based Test Process Method</i>	61
	<i>Stage 1: Risk Identification (Columns 1, 2)</i>	63
	<i>Stage 2: Risk Analysis (Columns 1–5)</i>	64
	<i>Stage 3: Risk Response (Columns 6–15, etc.)</i>	64
	<i>Stage 4: Test Scoping (Columns 1, 2, 8–15, etc.)</i>	67
	<i>Stage 5: Test Process Definition (Columns 8–15, etc.)</i>	69
	Method Guidance	70
	<i>Aren't the Risk Numbers Meaningless?</i>	70
	<i>What If Participants Can't Agree?</i>	71
	<i>What If a Test Objective Is Unachievable?</i>	72
	<i>What If the Testing Will Cost Too Much?</i>	73
	<i>Shouldn't We Automatically Include Simple Tests?</i>	73
	<i>Don't Forget Generic Test Objectives</i>	74
	<i>Risks and Exploratory Testing</i>	75
	Risk- and Benefit-Based Test Reporting	76
	References	80
Part II	Risk-Based E-Business Testing	83
5	E-Business and the Consequences of Failure	85
	E-Business, E-Commerce, and Everything E	85
	<i>A Typical Web Experience</i>	86
	<i>Web Site Failures and Their Consequences</i>	88
	<i>E-Business Maturity and Risk</i>	89

	Web Time and Other Challenges to Testers	90
	<i>Risky Projects and Testing</i>	92
	References	92
6	Types of Web Site Failures	93
	Web Site As Retail Store	94
	<i>No Second Chances</i>	95
	Many of the Risks Are Outside Your Control	96
	<i>Unlimited Potential Users</i>	96
	<i>Many Potential Points of Failure</i>	96
	<i>You Have No Control over Client Platforms</i>	97
	<i>You Have No Control over Client Configuration</i>	97
	<i>Which Browsers Do You Support?</i>	98
	<i>Your Users May Not Have the Required Plug-Ins</i>	99
	<i>The Context of Web Transactions Is a Risk Area</i>	99
	<i>Cookies Can Be a Problem</i>	100
	<i>Network Connections</i>	100
	<i>Firewalls May Get in the Way</i>	101
	<i>Anyone Can Visit</i>	101
	<i>Usability Is Now a Prime Concern</i>	101
	<i>Localization</i>	102
	The Sequence of Points of Failure in a Web Service	102
7	E-Business Test Strategy	105
	Specialized Knowledge and E-Business Testing Techniques	105
	Testing Considerations	106
	<i>Developer Testing</i>	106
	<i>Consider Using Test Drivers</i>	106
	<i>Configurations</i>	108
	<i>Web Conventions and Accessibility</i>	108
	Using a Test Process Framework to Build Your Test Strategy	110

	<i>Seven Categories of Tests</i>	110
	<i>Essential Testing Priorities</i>	113
	<i>Tests Types Can Be Static or Dynamic</i>	114
	<i>Stages of Testing</i>	114
	<i>Tests Can Be Automated or Manual</i>	114
	<i>Guidelines for Using the Test Process Framework</i>	115
	Postdeployment Monitoring	116
	References	116
8	From Risk Analysis to a Test Process	119
	Many Focused Stages or Bigger, Broader Test Stages?	119
	Know Your Users	121
	Where Do Nonfunctional Tests Fit?	123
	Build-and-Integration Strategies—an Example	123
	Automated Regression Testing	126
	Further Thoughts on Tools	127
	Reference	128
Part III	E-Business Test Techniques and Tools	129
9	Static Testing	131
	Overview	131
	Content Checking	131
	HTML Validation	134
	<i>Browsers Can Interpret HTML Differently</i>	135
	<i>Browsers Treat HTML Faults Differently</i>	135
	<i>Browsers Display HTML Differently</i>	135
	<i>Development Tools May Generate Poor HTML</i>	136
	<i>Remote Validation or In-House Tools?</i>	136
	<i>Examples of HTML Validators</i>	137
	<i>Varying the Depth of Testing</i>	139

	Browser Syntax Compatibility Checking	140
	Visual Browser Validation	141
	Tools for Static Testing	144
	References	145
10	Web Page Integration Testing	147
	Overview	147
	Link Checking	149
	<i>Missing Embedded Web Page Objects</i>	149
	<i>Missing Linked Objects</i>	150
	<i>Why Do Objects Go Missing?</i>	150
	<i>Other Return Codes from Web Servers</i>	151
	<i>Automated Link Checkers</i>	153
	Object Load and Timing	156
	Transaction Verification	158
	<i>HTTP GET</i>	160
	<i>HTTP POST</i>	161
	Tools for Web Page Integration Testing	163
	References	164
11	Functional Testing	165
	Overview	165
	<i>Architecture and Components</i>	170
	<i>Test Types and the Objects Under Test</i>	170
	<i>Automated Test Execution</i>	172
	Browser Page Testing	173
	Server-Based Component Testing	175
	Transaction Link Testing	177
	Application System Testing	179
	<i>Testing When Requirements Are of High Quality</i>	179
	<i>Testing When Requirements Are Poor</i>	180

Context Testing	182
<i>Cookies</i>	183
<i>Hidden Fields</i>	184
<i>Loss of Connection</i>	184
<i>Other Situations to Consider</i>	185
Localization Testing	185
Configuration Testing	186
<i>We Haven't the Time—Is There an Alternative?</i>	188
Tools for Functional Testing	189
References	190
12	
Service Testing	191
Overview	191
What Is Performance Testing?	195
<i>An Analogy</i>	195
<i>Performance Testing Objectives</i>	198
Prerequisites for Performance Testing	199
<i>Quantitative, Relevant, Measurable, Realistic, and Achievable Requirements</i>	200
<i>A Stable System</i>	200
<i>A Realistic Test Environment</i>	200
<i>A Controlled Test Environment</i>	201
<i>The Performance Testing Toolkit</i>	201
Performance Requirements	202
<i>Response Time Requirements</i>	203
<i>Load Profiles</i>	204
<i>Requirements Realism</i>	204
<i>Database Volumes</i>	206
The Performance Test Process	206
<i>Incremental Test Development</i>	207
<i>Test Execution</i>	208
<i>Results Analysis and Reporting</i>	209

	Performance Testing Practicalities	210
	<i>Which Performance Test Architecture?</i>	210
	<i>Compressed Timescales</i>	213
	<i>Software Quality</i>	214
	<i>Dedicated Environment</i>	214
	<i>Other Potential Problems</i>	214
	<i>Presenting Results to Customers and Suppliers</i>	216
	Reliability/Failover Testing	217
	<i>Failover Testing</i>	217
	<i>Reliability (or Soak) Testing</i>	220
	Service Management Testing	221
	Tools for Service Testing	223
	References	225
13	Usability Assessment	227
	Overview	227
	Other Methods	231
	Collaborative Usability Inspection	232
	<i>Heuristics on Which to Base Inspections</i>	232
	<i>Approach</i>	234
	<i>Inspection Roles</i>	235
	<i>Preparation for the Inspection</i>	235
	<i>Interactive Inspection Phase</i>	236
	<i>Static Inspection Phase</i>	237
	<i>Follow-Up</i>	237
	<i>Other Inspections</i>	238
	Usability Testing	238
	<i>Testing in the Field</i>	239
	<i>Test Process</i>	239
	Web Accessibility Checking	241
	Tools for Assessing Web Page Accessibility	243
	References	244

14	Security Testing	245
	Overview	245
	<i>Hackers, Crackers, Whackers, and Script Kiddies</i>	249
	<i>The Attacker's Methodology</i>	250
	<i>Denial of Service Attacks</i>	250
	<i>Security Vulnerabilities</i>	252
	Security Assessment	253
	<i>Choosing a Security Consultant</i>	253
	<i>Security Vulnerabilities</i>	254
	<i>Security Scanning Tools</i>	254
	Penetration Testing	256
	<i>Terms of Reference</i>	256
	<i>Penetration Test Goals</i>	257
	<i>Attack Methodology</i>	258
	<i>The Value of Penetration Testing</i>	259
	Tools for Security Testing	260
	References	261
	Further Reading	262
15	Large-Scale Integration Testing	263
	Overview	263
	<i>Integration Knowledge Is Critical to Success</i>	266
	<i>An Example of LSI</i>	266
	Integration Analysis	267
	<i>Inventories</i>	268
	<i>Transaction Analysis</i>	268
	<i>Business Object Definition</i>	272
	SIT	275
	BIT	276
	Challenges	278
	References	280

16	Postdeployment Monitoring	281
	Remote Monitoring Services	282
	Types of Monitoring	282
	<i>Link and Page Download Speed Checking</i>	282
	<i>Availability and Performance Monitoring</i>	283
	Security Monitoring	285
	Remote Monitoring Services and Tool Web Sites	287
17	Tools for E-Business Testing	291
	Proprietary Test Execution Tools	292
	<i>Justifying Automation</i>	295
	How Test Execution Tools Work	295
	<i>Capturing Test Scripts</i>	296
	<i>Customizing Test Scripts to Make Them Data-Driven</i>	298
	<i>Replaying Test Scripts</i>	298
	<i>Tools with Built-In Browsers</i>	300
	<i>Selecting Tests to Automate</i>	301
	Proprietary, Shareware, and Freeware Tools	301
	<i>Proprietary Tools</i>	303
	<i>Shareware Tools</i>	303
	<i>Freeware Tools</i>	303
	Sources of Tool Information	304
	References	305
	Further Reading	305
Part IV	Making E-Business Testing Happen	307
18	The Context of E-Business Testing	309
	Methods and Requirements Formats	310
	<i>XP</i>	311
	<i>UML and Unified Process</i>	313

	Architectures, Objects, Components, and Middleware	315
	Coping with Iterative and Incremental Methods	316
	References	319
19	E-Business Test Organization, Planning, and Specification	321
	Testing's Place in the Project	322
	Independent or Codependent?	322
	<i>Testing Manager as a Role</i>	323
	<i>QM and CM</i>	323
	Organization and Control	323
	Credibility of Testing	325
	Explaining Testing to Other Managers	327
	Estimation in a Vacuum	328
	Inversion of the Tester's Role	332
	Testing Stages, Teams, and Environments	333
	Getting, Organizing, and Keeping Resources	334
	<i>Environments</i>	334
	<i>Staffing</i>	336
	<i>Retention</i>	338
	Specifying Tests	339
	<i>Stage Test Plans</i>	340
	<i>Test Design</i>	341
	<i>Expected Results</i>	341
	Stage-Specific Considerations	342
	<i>Testing Interfaces with Other Systems</i>	342
	<i>Acceptance Testing Viewpoints</i>	343
	References	345

20	E-Business Test Execution	347
	Incident Management	349
	Testing in a Live Environment	351
	<i>Prelive Testing</i>	352
	<i>Pseudolive Testing</i>	352
	<i>Pilot</i>	352
	Managing the End Game	353
	References	354
	Further Reading	354
	Appendix A: Essential Web Technologies for Testers	355
	Appendix B: Web Testing Using Home-Brew Tools	359
	Using Dummy HTML Forms To Test Components	359
	Using Test Drivers To Test Components	361
	The Simplest of Test Drivers	363
	Reference	367
	Further Reading	367
	List of Acronyms and Abbreviations	369
	Glossary	373
	About the Authors	385
	Index	387