

Contents

1	Introduction to Business Process Management	1
1.1	Processes Everywhere	1
1.2	Ingredients of a Business Process	3
1.3	Origins and History of BPM	8
1.3.1	The Functional Organization	8
1.3.2	The Birth of Process Thinking	11
1.3.3	The Rise and Fall of BPR	13
1.4	The BPM Lifecycle	16
1.5	Recap	27
1.6	Solutions to Exercises	28
1.7	Further Exercises	30
1.8	Further Readings	32
2	Process Identification	35
2.1	The Context of Process Identification	35
2.2	Definition of the Process Architecture	41
2.2.1	Process Categories	41
2.2.2	Relationships Between Processes	42
2.2.3	Reuse of Reference Models	45
2.2.4	Process Landscape Model	48
2.2.5	The Example of SAP's Process Architecture	55
2.3	Process Selection	56
2.3.1	Selection Criteria	56
2.3.2	Process Performance Measures	59
2.3.3	Process Portfolio	64
2.4	Recap	65
2.5	Solutions to Exercises	66
2.6	Further Exercises	69
2.7	Further Readings	72



3	Essential Process Modeling	63
3.1	First Steps with BPMN	75
3.2	Branching and Merging	79
3.2.1	Exclusive Decisions	80
3.2.2	Parallel Execution	82
3.2.3	Inclusive Decisions	86
3.2.4	Rework and Repetition	90
3.3	Business Objects	93
3.4	Resources	96
3.5	Process Decomposition	102
3.6	Process Model Reuse	105
3.7	Recap	107
3.8	Solutions to Exercises	108
3.9	Further Exercises	112
3.10	Further Readings	114
4	Advanced Process Modeling	117
4.1	More on Rework and Repetition	117
4.1.1	Parallel Repetition	119
4.1.2	Uncontrolled Repetition	122
4.2	Handling Events	123
4.2.1	Message Events	123
4.2.2	Temporal Events	124
4.2.3	Racing Events	126
4.3	Handling Exceptions	129
4.3.1	Process Abortion	129
4.3.2	Internal Exceptions	130
4.3.3	External Exceptions	132
4.3.4	Activity Timeouts	133
4.3.5	Non-Interrupting Events and Complex Exceptions	133
4.3.6	Event Sub-processes	135
4.3.7	Activity Compensation	136
4.3.8	Summary	138
4.4	Processes and Business Rules	138
4.5	Recap	139
4.6	Solutions to Exercises	140
4.7	Further Exercises	149
4.8	Further Readings	157
5	Process Discovery	159
5.1	The Setting of Process Discovery	159
5.1.1	Process Analyst Versus Domain Expert	160
5.1.2	Three Process Discovery Challenges	162
5.2	Process Discovery Methods	165
5.2.1	Evidence-Based Discovery	165
5.2.2	Interview-Based Discovery	168



5.2.3	Workshop-Based Discovery	172
5.2.4	Strengths and Weaknesses	175
5.3	Process Modeling Method	177
5.3.1	Step 1: Identify the Process Boundaries	178
5.3.2	Step 2: Identify Activities and Events	178
5.3.3	Step 3: Identify Resources and Their Handoffs	179
5.3.4	Step 4: Identify the Control Flow	180
5.3.5	Step 5: Identify Additional Elements	182
5.3.6	Summary	182
5.4	Process Model Quality Assurance	183
5.4.1	Syntactic Quality and Verification	183
5.4.2	Semantic Quality and Validation	187
5.4.3	Pragmatic Quality and Certification	189
5.4.4	Modeling Guidelines and Conventions	192
5.5	Recap	194
5.6	Solutions to Exercises	195
5.7	Further Exercises	205
5.8	Further Readings	211
6	Qualitative Process Analysis	213
6.1	Value-Added Analysis	213
6.2	Waste Analysis	218
6.2.1	Move	219
6.2.2	Hold	221
6.2.3	Overdo	222
6.3	Stakeholder Analysis and Issue Documentation	224
6.3.1	Stakeholder Analysis	225
6.3.2	Issue Register	229
6.3.3	Pareto Analysis and PICK Charts	232
6.4	Root Cause Analysis	236
6.4.1	Cause-Effect Diagrams	236
6.4.2	Why-Why Diagrams	241
6.5	Recap	244
6.6	Solutions to Exercises	244
6.7	Further Exercises	249
6.8	Further Readings	253
7	Quantitative Process Analysis	255
7.1	Flow Analysis	255
7.1.1	Calculating Cycle Time Using Flow Analysis	256
7.1.2	Cycle Time Efficiency	261
7.1.3	Critical Path Method	263
7.1.4	Little's Law	266
7.1.5	Capacity and Bottlenecks	267
7.1.6	Flow Analysis for Cost	271
7.1.7	Limitations of Flow Analysis	272



7.2	Queues	233
7.2.1	Basics of Queueing Theory	274
7.2.2	M/M/1 and M/M/c Models	276
7.2.3	Limitations of Basic Queueing Theory	279
7.3	Simulation	279
7.3.1	Anatomy of a Process Simulation	279
7.3.2	Input for Process Simulation	280
7.3.3	Simulation Tools	286
7.3.4	A Word of Caution	287
7.4	Recap	288
7.5	Solutions to Exercises	288
7.6	Further Exercises	291
7.7	Further Readings	295
8	Process Redesign	297
8.1	The Essence of Process Redesign	297
8.1.1	Product Versus Process Innovation	298
8.1.2	Redesign Concepts	300
8.1.3	The Devil's Quadrangle	303
8.1.4	Approaches to Redesign	304
8.1.5	The Redesign Orbit	306
8.2	Transactional Methods	307
8.2.1	Overview of Transactional Methods	308
8.2.2	7FE	312
8.2.3	Heuristic Process Redesign	315
8.3	Transformational Methods	319
8.3.1	Overview of Transformational Methods	319
8.3.2	Business Process Reengineering	323
8.3.3	Product-Based Design	325
8.4	Recap	329
8.5	Solutions to Exercises	330
8.6	Further Exercises	333
8.7	Further Readings	338
9	Process-Aware Information Systems	341
9.1	Types of Process-Aware Information Systems	341
9.1.1	Domain-Specific Process-Aware Information Systems	342
9.1.2	Business Process Management Systems	344
9.1.3	Architecture of a BPMS	347
9.1.4	The Case of ACNS	353
9.2	Advantages of Introducing a BPMS	355
9.2.1	Workload Reduction	355
9.2.2	Flexible System Integration	356
9.2.3	Execution Transparency	358
9.2.4	Rule Enforcement	359



9.3	Challenges of Introducing a BPMS	360
9.3.1	Technical Challenges	360
9.3.2	Organizational Challenges	362
9.4	Recap	365
9.5	Solutions to Exercises	365
9.6	Further Exercises	367
9.7	Further Readings	368
10	Process Implementation with Executable Models	371
10.1	Identify the Automation Boundaries	372
10.2	Review Manual Tasks	375
10.3	Complete the Process Model	378
10.4	Bring the Process Model to an Adequate Granularity Level	381
10.4.1	Task Decomposition	381
10.4.2	Decomposition of Ad Hoc Sub-Processes with CMMN	382
10.4.3	Task Aggregation	384
10.5	Specify Execution Properties	384
10.5.1	Variables, Messages, Signals, Errors, and Their Data Types	386
10.5.2	Data Mappings	388
10.5.3	Service Tasks	389
10.5.4	Send and Receive Tasks, Message and Signal Events ...	390
10.5.5	Script Tasks	391
10.5.6	User Tasks	391
10.5.7	Task, Event, and Sequence Flow Expressions	394
10.5.8	Implementing Rules with DMN	394
10.5.9	Other BPMS-Specific Properties	396
10.6	The Last Mile	399
10.7	Recap	400
10.8	Solutions to Exercises	400
10.9	Further Exercises	408
10.10	Further Readings	411
11	Process Monitoring	413
11.1	The Context of Process Monitoring	413
11.2	Process Performance Dashboards	415
11.2.1	Operational Dashboards	415
11.2.2	Tactical Dashboards	416
11.2.3	Strategic Dashboards	418
11.2.4	Tools for Dashboard Creation	419
11.3	Introduction to Process Mining	419
11.3.1	Process Mining Techniques	420
11.3.2	Event Logs	421
11.4	Automated Process Discovery	427
11.4.1	Dependency Graphs	428



11.4.2	The α -Algorithm	432
11.4.3	Robust Process Discovery	436
11.4.4	Quality Measures for Automated Process Discovery	439
11.5	Process Performance Mining	442
11.5.1	Time Dimension	442
11.5.2	Cost Dimension	447
11.5.3	Quality Dimension	448
11.5.4	Flexibility Dimension	450
11.6	Conformance Checking	451
11.6.1	Conformance of Control Flow	452
11.6.2	Conformance of Data and Resources	457
11.7	Variants Analysis	458
11.8	Putting It All Together: Process Mining in Practice	461
11.9	Recap	463
11.10	Solutions to Exercises	464
11.11	Further Exercises	470
11.12	Further Readings	472
12	BPM as an Enterprise Capability	475
12.1	Barriers to BPM Success	476
12.2	The Six Success Factors of BPM Maturity	477
12.2.1	Strategic Alignment	480
12.2.2	Governance	484
12.2.3	People	486
12.2.4	Culture	488
12.3	Measuring Process Maturity and BPM Maturity	490
12.4	Recap	495
12.5	Solutions to Exercises	495
12.6	Further Exercises	498
12.7	Further Readings	499
A	Redesign Heuristics	501
A.1	Customer Heuristics	501
A.2	Business Process Operation Heuristics	502
A.3	Business Process Behavior Heuristics	503
A.4	Organization Heuristics	503
A.5	Information Heuristics	505
A.6	Technology Heuristics	505
A.7	External Environment Heuristics	506
	References	509
	Index	519