
Contents

Part I Foundation

1	Introduction	3
1.1	Motivation and Definitions	4
1.2	Business Process Lifecycle	11
1.3	Classification of Business Processes	17
1.4	Goals, Structure, and Organization	21
2	Evolution of Enterprise Systems Architectures	25
2.1	Traditional Application Development	26
2.2	Enterprise Applications and their Integration	28
2.3	Enterprise Modelling and Process Orientation	39
2.4	Workflow Management	49
2.5	Enterprise Services Computing	57
2.6	Summary	65
	Bibliographical Notes	67

Part II Business Process Modelling

3	Business Process Modelling Foundation	73
3.1	Conceptual Model and Terminology	73
3.2	Abstraction Concepts	75
3.3	From Business Functions to Business Processes	78
3.4	Activity Models and Activity Instances	83
3.5	Process Models and Process Instances	87
3.6	Process Interactions	96
3.7	Modelling Process Data	98
3.8	Modelling Organization	102
3.9	Modelling Operation	107
3.10	Business Process Flexibility	111

3.11	Architecture of Process Execution Environments	120
	Bibliographical Notes	123
4	Process Orchestrations	125
4.1	Control Flow Patterns	126
4.2	Petri Nets	149
4.3	Event-driven Process Chains	159
4.4	Workflow Nets	169
4.5	Yet Another Workflow Language	182
4.6	Graph-Based Workflow Language	200
4.7	Business Process Model and Notation	206
	Bibliographical Notes	241
5	Process Choreographies	243
5.1	Motivation and Terminology	244
5.2	Development Phases	247
5.3	Process Choreography Design	249
5.4	Process Choreography Implementation	260
5.5	Service Interaction Patterns	267
5.6	Let's Dance	275
5.7	Choreography Modelling in BPMN	279
	Bibliographical Notes	290
6	Properties of Business Processes	293
6.1	Data Dependencies	294
6.2	Object Lifecycle Conformance	296
6.3	Structural Soundness	299
6.4	Soundness	300
6.5	Relaxed Soundness	308
6.6	Weak Soundness	313
6.7	Lazy Soundness	318
6.8	Soundness Criteria Overview	326
	Bibliographical Notes	328

Part III Architectures and Methodologies

7	Business Process Management Architectures	333
7.1	Workflow Management Architectures	333
7.2	Flexible Workflow Management	338
7.3	Web Services and their Composition	343
7.4	Advanced Service Composition	352
7.5	Data-Driven Processes: Case Handling	361
	Bibliographical Notes	370

8 Business Process Management Methodology 373

 8.1 Dependencies between Processes 373

 8.2 Methodology Overview 376

 8.3 Phases in Detail 378

 Bibliographical Notes 387

References 389

Index 399