

Table of Contents

- 1 Coping with Semantic Variety in E-Business..... 1**
 - 1.1 Semantic Variety and Ambiguity 1
 - 1.2 Research Agenda 3
 - 1.3 Research Objectives 5
 - 1.4 Business Application Domains 8
 - 1.5 Book Structure 9

Part I: E-Business Integration: Processes, Applications, Standards

- 2 Integrating Processes, Applications and Information 13**
 - 2.1 The Business Case for E-Integration 13
 - 2.1.1 The Business Process Paradigm 14
 - 2.1.2 Process Integration 14
 - 2.1.3 Business Processes and Information Technology..... 15
 - 2.2 Application Integration..... 16
 - 2.2.1 Networks for Application Integration..... 16
 - 2.2.2 Business Applications..... 17
 - 2.2.3 Intercompany Document Exchange – EDI 18
 - 2.2.4 Supply Chain Management 20
 - 2.2.5 Electronic Markets..... 22
 - 2.3 Information Integration..... 26
 - 2.3.1 Information Concept and Typology..... 26
 - 2.3.2 Integration Levels 28
 - 2.3.3 Integration Methods..... 29
- 3 E-Business Standards 31**
 - 3.1 Definition..... 31
 - 3.2 An E-Business Standards Typology 32
 - 3.2.1 Formatting Technical and Business Information..... 32
 - 3.2.2 Levels of E-Business Standardization 33
 - 3.2.3 Standards Typology Model 39
 - 3.3 Technical Standards..... 41
 - 3.4 Syntactic Standards..... 41

3.5 Semantic Standards.....	44
3.5.1 Identification Standards.....	46
3.5.2 Classification Standards.....	49
3.5.3 Catalog Exchange Formats.....	55
3.5.4 Transaction Standards.....	58
3.6 Process Standards.....	62
3.7 Semantic Variety.....	64
3.7.1 Application Scope of E-Business Semantics.....	64
3.7.2 Semantic Heterogeneity.....	65
3.7.3 Criteria for Standards Selection.....	68
3.7.4 E-Business Diffusion and Standard Adoption.....	70
4 Case Study: Designing ebXML – The Work of UN/CEFACT	79
4.1 Background – UN/CEFACT’s B2B Goal.....	79
4.1.1 The ebXML Vision à la UN/CEFACT.....	80
4.1.2 The ebXML Scenario.....	81
4.1.3 The Role of Large Companies/Organizations/Industries.....	82
4.1.4 How SMEs Will Benefit.....	84
4.2 The ebXML Initiative (1999-2001).....	84
4.3 The Transition Period (2001-2004).....	87
4.4 A Critical Evaluation of ebXML.....	88
4.4.1 Did ebXML Fulfill Its Promise?.....	89
4.4.2 The Successful Elements of ebXML.....	90
4.4.3 Why Didn’t the ebXML Elements Dealing with Business Semantics Succeed?.....	91
4.5 Conclusion.....	92

Part II: Knowledge Management Technologies

5 Ontology Engineering.....	97
5.1 Ontologies in Computer Science.....	97
5.1.1 Structure.....	98
5.1.2 Types of Ontologies.....	100
5.2 Representation.....	102
5.2.1 Logical Representation.....	102
5.2.2 Ontology Languages.....	104
5.2.3 Visualization.....	107
5.3 Ontology Mismatches.....	109
5.3.1 Types of Mismatch.....	109
5.3.2 Basic Resolution Approaches.....	112
5.4 Engineering Techniques.....	112
5.4.1 Creation.....	113

5.4.2 Coordination	115
5.4.3 Merging	123
6 Advanced Knowledge Creation Techniques.....	125
6.1 Methods from Artificial Intelligence	125
6.1.1 Ontology Inference and Ontology Reasoning	126
6.1.2 Machine Learning.....	127
6.1.3 Knowledge Evolution.....	129
6.2 Ontology Mapping Disambiguation	132
6.2.1 Ratings- and Context-Based Approaches	132
6.2.2 Community-Based Approaches.....	136
7 Semantic Web Programming Frameworks	139
7.1 Rationale.....	139
7.2 Basic Framework Features	140
7.3 Advanced Framework Features	141
7.4 Framework Examples	142
Part III: E-Business Integration with Semantic Technologies	
8 A Methodology for Semantic E-Business Integration	153
8.1 Semantic Synchronization	153
8.1.1 Synchronization in E-Business Processes	154
8.1.2 Semantic References.....	155
8.2 Adaptive Semi-automated Semantic Referencing	156
8.2.1 Step 1: Conversion.....	157
8.2.2 Step 2: Matching and Mapping	158
8.2.3 Step 3: Deducing New Knowledge.....	160
8.2.4 Step 4: Storage.....	160
8.2.5 Steps 5 and 6: Reference Provision	160
8.2.6 Steps 7 and 8: Intelligence Collection	161
8.3 Context Sensitivity	162
8.3.1 Ratings.....	162
8.3.2 Context Definition	163
8.3.3 Context Description.....	165
8.3.4 Determination	166
8.4 Comprehensive Semantic Support.....	171
9 Access Control for E-Business Integration.....	173
9.1 Rationale.....	173
9.2 Scenario	174
9.3 History-Based Access Control.....	176

9.3.1 Histories.....	176
9.3.2 Operations.....	178
9.3.3 Rules.....	179
9.4 Security Architecture.....	181
9.4.1 Architecture Overview.....	181
9.4.2 Workflow.....	182
9.5 Modeling Access to Standards.....	183
9.6 Related Work.....	190
9.7 Conclusion.....	191
10 Case Study: An Application for Dynamic Semantic E-Business Integration – The ORBI Ontology Mediator.....	193
10.1 E-Business Integration Scenarios.....	193
10.1.1 User Interface.....	194
10.1.2 Browser Plug-In for Web-Based E-Business Applications.....	196
10.1.3 Web-Service-Based Application Integration.....	197
10.2 Use Cases.....	200
10.2.1 Administrator Activities.....	200
10.2.2 User Activities.....	201
10.2.3 Expert User Activities.....	202
10.2.4 System Activities.....	203
10.3 Web Service Functionality.....	204
10.3.1 Core Functions.....	205
10.3.2 Advanced Functions.....	205
10.3.3 Support Functions.....	206
10.4 Class Model for Reference Management.....	207
10.5 Implementation.....	208
10.5.1 Technology.....	208
10.5.2 System Architecture.....	208
10.5.3 System Functionality.....	210
10.5.4 External Systems Adapters.....	213
10.6 System Evaluation.....	215
10.7 Discussion.....	218
11 Business Integration – Past, Present and Beyond.....	221
11.1 Technical Challenges.....	222
11.2 Business Challenges.....	223
11.3 Conceptual Challenges.....	224
List of Abbreviations.....	227
List of Figures.....	231

List of Tables 235

References..... 237

Index..... 263



<http://www.springer.com/978-3-540-75229-5>

Ontologies-Based Business Integration

Rebstock, M.; Janina, F.; Paulheim, H.

2008, XIII, 268 p., Hardcover

ISBN: 978-3-540-75229-5