

CONTENTS

Foreword by Inderpal Bhandari	xvii
Foreword by Aaron Zornes	xix
Preface	xxi
PART ONE: Getting Started	1
Chapter 1: An Introduction to Big Data Governance	3
Chapter 2: The Big Data Governance Framework	9
2.1 Big Data Types	10
2.2 Information Governance Disciplines	12
2.3 Industry and Functional Scenarios for Big Data Governance	15
Summary	27
Chapter 3: The Maturity Assessment	29
3.1 The IBM Information Governance Council Maturity Model	29
3.2 Sample Questions to Assess Maturity	31
Summary	36
Chapter 4: The Business Case	37
4.1 Improve On-Time Performance and Passenger Safety Through Big Data Governance	37
4.2 Quantify the Financial Impact of Big Data Governance on Customer Privacy	39
4.3 Reduce IT Costs by Governing the Lifecycle of Big Data	40
4.4 Estimate the Impact of Data Quality and Master Data on Big Data Initiatives	41
Summary	42
Chapter 5: The Roadmap	43
5.1 The Roadmap Case Studies	43
Summary	46
PART TWO: Big Data Governance Disciplines	47
Chapter 6: Organizing for Big Data Governance	49
6.1 Map Key Processes and Establish a RACI Matrix to Identify Stakeholders in Big Data Governance	49
6.2 Determine the Appropriate Mix of New and Existing Roles for Information Governance	54
6.3 Appoint Big Data Stewards as Appropriate	55

6.4	Add Big Data Responsibilities to Traditional Information Governance Roles as Appropriate	60
6.5	Establish a Merged Information Governance Organization with Responsibilities That Include Big Data	63
	Summary	65
Chapter 7: Metadata		67
7.1	Establish a Glossary That Represents the Business Definitions for Key Big Data Terms	68
7.2	Understand the Ongoing Support for Metadata Within Apache Hadoop	71
7.3	Tag Sensitive Big Data Within the Business Glossary	73
7.4	Import Technical Metadata from the Relevant Big Data Stores	74
7.5	Link the Relevant Data Sources to the Terms in the Business Glossary	74
7.6	Leverage Operational Metadata to Monitor the Movement of Big Data	75
7.7	Maintain Technical Metadata to Support Data Lineage and Impact Analysis	75
7.8	Gather Metadata from Unstructured Documents to Support Enterprise Search	77
7.9	Extend Existing Metadata Roles to Include Big Data	77
	Summary	78
Chapter 8: Big Data Privacy		79
8.1	Identify Sensitive Big Data	84
8.2	Flag Sensitive Big Data Within the Metadata Repository	86
8.3	Address Privacy Laws and Regulations by Country, State, and Province	86
8.4	Manage Situations Where Personal Data Crosses International Boundaries	96
8.5	Monitor Access to Sensitive Big Data by Privileged Users	98
	Summary	99
Chapter 9: Big Data Quality		101
9.1	Work with Business Stakeholders to Establish and Measure Confidence Intervals for the Quality of Big Data	102
9.2	Leverage Semi-Structured and Unstructured Data to Improve the Quality of Sparsely Populated Structured Data	107
9.3	Use Streaming Analytics to Address Data Quality Issues In-Memory Without Landing Interim Results to Disk	107
9.4	Appoint Data Stewards Accountable to the Information Governance Council for Improving the Metrics Over Time	111
	Summary	112
Chapter 10: Business Process Integration		113
10.1	Identify the Key Processes That Will Be Impacted by Big Data Governance	114
10.2	Build a Process Map with Key Activities	115

10.3	Map Big Data Governance Policies to the Key Steps in the Process	116
	Summary	116
Chapter 11: Master Data Integration		117
11.1	Improve the Quality of Master Data to Support Big Data Analytics	119
11.2	Leverage Big Data to Improve the Quality of Master Data	121
11.3	Improve the Quality and Consistency of Key Reference Data to Support the Big Data Governance Program	124
11.4	Consider Social Media Platform Policies to Determine the Level of Integration with Master Data Management	125
11.5	Extract Meaning from Unstructured Text to Enrich Master Data	126
	Summary	131
Chapter 12: Managing the Lifecycle of Big Data		133
12.1	Expand the Retention Schedule to Include Big Data Based on Local Regulations and Business Needs	134
12.2	Document Legal Holds and Support eDiscovery Requests	136
12.3	Compress and Archive Big Data to Reduce IT Costs and Improve Application Performance	137
12.4	Manage the Lifecycle of Real-Time, Streaming Data	138
12.5	Retain Social Media Records to Comply with Regulations and Support eDiscovery Requests	139
12.6	Defensibly Dispose of Big Data No Longer Required Based on Regulations and Business Needs	140
	Summary	140
PART THREE: The Governance of Big Data Types		141
Chapter 13: Web and Social Media		143
13.1	Consider Evolving Regulations and Customs When Establishing Policies Regarding the Acceptable Use of Social Media Data About Customers	145
13.2	Set Up Policies Regarding the Acceptable Use of Social Media Data About Employees and Job Candidates	150
13.3	Leverage Confidence Intervals to Assess the Quality of Social Media Data	152
13.4	Establish Policies Regarding the Acceptable Use of Cookies and Other Web Tracking Devices	154
13.5	Define Policies to Link Online and Offline Data in a Way That Does Not Violate Privacy Concerns and Regulations	162
13.6	Ensure the Consistency of Web Metrics	165
	Summary	167

Chapter 14: Machine-to-Machine Data	169
14.1 Assess the Types of Geolocation Data Currently Available	170
14.2 Establish Policies Regarding the Acceptable Use of Geolocation Data Pertaining to Customers	172
14.3 Establish Policies Regarding the Acceptable Use of Geolocation Data Pertaining to Employees	175
14.4 Ensure the Privacy of RFID Data	176
14.5 Define Policies Relating to the Privacy of Other Types of M2M Data	179
14.6 Address the Metadata and Quality of M2M Data	181
14.7 Establish Policies Regarding the Retention Period for M2M Data	184
14.8 Improve the Quality of Master Data to Support M2M Initiatives	184
14.9 Secure the SCADA Infrastructure from Vulnerability to Cyber Attacks	187
Summary	192
Chapter 15: Big Transaction Data	193
Summary	198
Chapter 16: Biometrics	199
16.1 Assess the Privacy Implications Relating to the Acceptable Use of Biometric Data	200
16.2 Work with Legal Counsel to Determine the Impact of Evolving Regulations on the Use of Biometric Data for Customers and Employees	202
Summary	204
Chapter 17: Human-Generated Data	205
17.1 Establish Policies to Mask Sensitive Human-Generated Data	206
17.2 Use Unstructured Human-Generated Data to Improve the Quality of Structured Data	207
17.3 Manage the Lifecycle of Human-Generated Data to Reduce Costs and Comply with Regulations	208
17.4 Extract Insights from Unstructured Human-Generated Data to Enrich MDM	208
Summary	209
PART FOUR: Industry Perspectives	211
Chapter 18: Healthcare	213
18.1 Leverage Unstructured Data to Improve the Quality of Sparsely Populated Structured Data	214
18.2 Extract Additional Relevant Clinical Factors Not Available Within Structured Data	215
18.3 Define Consistent Definitions for Key Business Terms	216
18.4 Ensure Consistency in Patient Master Data Across Facilities	216

18.5 Adhere to Privacy Requirements for Protected Health Information in Accordance with HIPAA	216
18.6 Creatively Manage Reference Data to Yield Effective Clinical Insights	217
Summary	217
Chapter 19: Utilities	219
19.1 Duplicate Meter Readings	222
19.2 Referential Integrity of the Primary Key	222
19.3 Anomalous Meter Readings	222
19.4 Data Quality for Customer Addresses	223
19.5 Information Lifecycle Management	223
19.6 Database Monitoring	224
19.7 Technical Architecture	224
Summary	226
Chapter 20: Communications Service Providers	227
20.1 Big Data Types	228
20.2 Integrating Big Data with Master Data	229
20.3 Big Data Privacy	231
20.4 Big Data Quality	232
20.5 Big Data Lifecycle Management	233
Summary	233
PART FIVE: Big Data Technology	235
Chapter 21: Big Data Reference Architecture	237
21.1 Big Data Sources	239
21.2 Open Source Foundational Components	239
21.3 Hadoop Distributions	241
21.4 Streaming Analytics	242
21.5 Databases	243
21.6 Big Data Integration	244
21.7 Text Analytics	246
21.8 Big Data Discovery	247
21.9 Big Data Quality	248
21.10 Metadata for Big Data	249
21.11 Information Policy Management	249
21.12 Master Data Management	250
21.13 Data Warehouses and Data Marts	251
21.14 Big Data Analytics and Reporting	252
21.15 Big Data Security and Policy	254
21.16 Big Data Lifecycle Management	255

21.17 The Cloud	258
Summary	259
Chapter 22: Big Data Platforms	261
22.1 IBM	262
22.2 Oracle	268
22.3 SAP	272
22.4 The Microsoft Big Data Platform	276
22.5 HP	278
22.6 Informatica	279
22.7 SAS	282
22.8 Teradata	283
22.9 EMC	284
22.10 Amazon	284
22.11 Google	285
22.12 Pentaho	285
22.13 Talend	286
Summary	286
Appendix A: List of Acronyms	287
Appendix B: Glossary	291
Appendix C: Reviewer Profiles	313
Appendix D: Contributor Profiles	317
Index	333