CONTENTS

About the Author		iv
Forewords		XV
by Aditya Kongara		XV
by John R. Talburt		xvi
by Aaron Zornes		xviii
Preface		xxi
PART I—INTRODUCTION		1
1: An Introduction to Data G	overnance	3
Definition		3
Case Study		5
The Pillars of Data Governa	nce	5
Summary		6
2: Enterprise Data Managem	ent Reference Architecture	7
EDM Categories		8
Big Data		13
Data Governance Tools		14
Summary		14
PART II—CATEGORIES OF DA	ATA GOVERNANCE TOOLS	15
3: The Business Glossary		17
Bulk-Load Business Terms	in Excel, CSV, or XML Format	17
Create Categories of Busine	ss Terms	20

vi Contents

	Facilitate Social Collaboration	20
	Automatically Hyperlink Embedded Business Terms	21
	Add Custom Attributes to Business Terms and Other Data Artifacts	22
	Add Custom Relationships to Business Terms and Other Data Artifacts	23
	Add Custom Roles to Business Terms and Other Data Artifacts	23
	Link Business Terms and Column Names to the Associated Reference Data	24
	Link Business Terms to Technical Metadata	25
	Support the Creation of Custom Asset Types	26
	Flag Critical Data Elements	28
	Provide OOTB and Custom Workflows to Manage Business Terms and Other Data Artifacts	28
	Review the History of Changes to Business Terms and Other Data Artifacts	32
	Allow Business Users to Link to the Glossary Directly from Reporting Tools	33
	Search for Business Terms	34
	Integrate Business Terms with Associated Unstructured Data	35
	Summary	36
4:	Metadata Management	37
	Pull Logical Models from Data Modeling Tools	37
	Pull Physical Models from Data Modeling Tools	38
	Ingest Metadata from Relational Databases	40
	Pull in Metadata from Data Warehouse Appliances	41
	Integrate Metadata from Legacy Data Sources	42
	Pull Metadata from ETL Tools	43
	Pull Metadata from Reporting Tools	44
	Reflect Custom Code in the Metadata Tool	45
	Pull Metadata from Analytics Tools	47
	Link Business Terms with Column Names	48
	Pull Metadata from Data Quality Tools	48
	Pull Metadata from Big Data Sources	50
	Provide Detailed Views on Data Lineage	51
	Customize Data Lineage Reporting	52
	Manage Permissions in the Metadata Repository	55
	Support the Search for Assets in the Metadata Repository	57
	Summary	58
5:	Data Profiling	59
	Conduct Column Analysis	59

	Discover the Values Distribution of a Column	61
	Discover the Patterns Distribution of a Column	62
	Discover the Length Frequencies of a Column	63
	Discover Hidden Sensitive Data	64
	Discover Values with Similar Sounds in a Column	65
	Agree on the Data Quality Dimensions for the Data Governance Program	66
	Develop Business Rules Relating to the Data Quality Dimensions	67
	Profile Data Relating to the Completeness Dimension of Data Quality	69
	Profile Data Relating to the Conformity Dimension of Data Quality	69
	Profile Data Relating to the Consistency Dimension of Data Quality	71
	Profile Data Relating to the Synchronization Dimension of Data Quality	71
	Profile Data Relating to the Uniqueness Dimension of Data Quality	73
	Profile Data Relating to the Timeliness Dimension of Data Quality	74
	Profile Data Relating to the Accuracy Dimension of Data Quality	75
	Discover Data Overlaps Across Columns	76
	Discover Hidden Relationships Between Columns	80
	Discover Dependencies	81
	Discover Data Transformations	84
	Create Virtual Joins or Logical Data Objects That Can Be Profiled	86
	Summary	88
6:	Data Quality Management	89
	Transform Data into a Standardized Format	89
	Improve the Quality of Address Data	93
	Match and Merge Duplicate Records	95
	Create a Data Quality Scorecard	98
	Select the Data Domain or Entity	98
	Define the Acceptable Thresholds of Data Quality	98
	Select the Data Quality Dimensions to Be Measured for the Specific Data Domain or Entity	99
	Select the Weights for Each Data Quality Dimension	99
	Select the Business Rules for Each Data Quality Dimension	100
	Assign Weights to Each Business Rule in a Given Data Quality Dimension	101
	Bind the Business Rules to the Relevant Columns	102
	View the Data Quality Scorecard	103
	Highlight the Financial Impact Associated with Poor Data Quality	104
	Conduct Time Series Analysis	104

	Manage Data Quality Exceptions Summary	106 108
7:		100
/.	Master Data Management Define Business Terms Consumed by the MDM Hub	109
	Manage Entity Relationships	109
		111
	Manage Master Data Enrichment Rules	112
	Manage Master Data Validation Rules	113
	Manage Record Matching Rules	
	Manage Record Consolidation Rules	116
	View a List of Outstanding Data Stewardship Tasks	117
	Manage Duplicates	119
	View the Data Stewardship Dashboard	121
	Manage Hierarchies	122
	Improve the Quality of Master Data	122
	Integrate Social Media with MDM	125
	Manage Master Data Workflows	126
	Compare Snapshots of Master Data	127
	Provide a History of Changes to Master Data	128
	Offload MDM Tasks to Hadoop for Faster Processing	129
	Summary	131
8:	Reference Data Management	133
	Build an Inventory of Code Tables	134
	Agree on the Master List of Values for Each Code Table	135
	Build Simple Mappings Between Master Values and Related Code Tables	137
	Build Complex Mappings Between Code Values	137
	Manage Hierarchies of Code Values	139
	Build and Compare Snapshots of Reference Data	140
	Visualize Inter-Temporal Crosswalks Between Reference Data Snapshots	141
	Summary	143
9:	Information Policy Management	145
	Manage Information Policies, Standards, and Processes Within the Business Glossary	147
	Manage Business Rules	147
	Leverage Data Governance Tools to Monitor and Report on Compliance	149
	Manage Data Issues	149
	Summary	157

PAF	RT III—THE INTEGRATION BETWEEN ENTERPRISE DATA MANAGEMENT AND	
	DATA GOVERNANCE TOOLS	159
10:	Data Modeling	161
	Integrate the Logical and Physical Data Models with the Metadata Repository	162
	Expose Ontologies in the Metadata Repository	163
	Prototype a Unified Schema Across Data Domains Using Data Discovery Tools	163
	Establish a Data Model to Support Master Data Management	166
	Summary	167
11:	Data Integration	169
	Deploy Data Quality Jobs in an Integrated Manner with Data Integration	170
	Move Data Between the MDM or Reference Data Hub and the Source Systems	172
	Leverage Reference Data for Use by the Data Integration Tool	173
	Integrate Data Integration Tools into the Metadata Repository	174
	Automate the Production of Data Integration Jobs by Leveraging the Metadata Repository	174
	Summary	175
12:	Analytics and Reporting	177
	Export Data Profiling Results to a Reporting Tool for Further Visual Analysis	177
	Export Data Artifacts to a Reporting Tool for the Visualization of Data Governance Metric	
		178
	Integrate Analytics and Reporting Tools with the Business Glossary for Semantic Context	
	Summary	180
13:	Business Process Management	181
	Data Governance Workflows Should Leverage BPM Capabilities	181
	Master Data Workflows Should Leverage BPM Capabilities	186
	Data Governance Tools Should Map to BPM Tools	187
	Summary	188
14:	Data Security and Privacy	189
	Determine Privacy Obligations	190
	Discover Sensitive Data Using Data Discovery Tools	190
	Flag Sensitive Data in the Metadata Repository	191
	Mask Sensitive Data in Production Environments	193
	Mask Sensitive Data in Non-Production Environments	193
	Monitor Database Access by Privileged Users	194

X Data Governance Tools

	Document Information Policies Implemented by Data Masking and Database Monitoring Tools	195
	Create a Complete Business Object Using Data Discovery Tools That Can Be Acted Upon by Data Masking Tools	199
	Summary	200
15:	Information Lifecycle Management	201
	Document Information Policies in the Business Glossary That Are Implemented by ILM Tools	204
	Discover Complete Business Objects That Can Be Acted on Efficiently by ILM Tools	204
	Summary	205
PAR	RT IV—BIG DATA GOVERNANCE TOOLS	207
16:	Hadoop and NoSQL	209
	Conduct an Inventory of Data in Hadoop	211
	Assign Ownership for Data in Hadoop	212
	Provision a Semantic Layer for Analytics in Hadoop	213
	View the Lineage of Data In and Out of Hadoop	216
	Manage Reference Data for Hadoop	219
	Profile Data Natively in Hadoop	221
	Discover Data Natively in Hadoop	223
	Execute Data Quality Rules Natively in Hadoop	224
	Integrate Hadoop with Master Data Management	226
	Port Data Governance Tools to Hadoop for Improved Performance	229
	Govern Data in NoSQL Databases	231
	Mask Sensitive Data in Hadoop	232
	Summary	232
17:	Stream Computing	233
	Use Data Profiling Tools to Understand a Sample Set of Input Data	234
	Govern Reference Data to Be Used by the Stream Computing Application	235
	Govern Business Terms to Be Used by the Stream Computing Application	236
	Summary	237
18:	Text Analytics	239
	Big Data Governance to Reduce the Readmission Rate for Patients with Congestive Heart Failure	240

	Leverage Unstructured Data to Improve the Quality of Sparsely Populated	2.41
	Structured Data Extract Additional Relevant Predictive Variables Not Available in Structured Data	241 242
	Define Consistent Definitions for Key Business Terms	242
	Ensure Consistency in Patient Master Data Across Facilities	242
	Adhere to Privacy Requirements	242
	Manage Reference Data	243
	Summary	243
PAR	TT V—EVALUATION CRITERIA AND THE VENDOR LANDSCAPE	245
	The Evaluation Criteria for Data Governance Platforms	247
1).	The Total Cost of Ownership	247
	Data Stewardship	248
	Approval Workflows	248
	The Hierarchy of Data Artifacts	249
	Data Governance Metrics	256
	The Cloud	258
	Summary	258
20:	ASG	259
	ASG-metaGlossary	259
	ASG-Rochade	260
	ASG-becubic	260
21:	Collibra	263
	Business Glossary	263
	Reference Data Management	264
	Data Stewardship	265
	Workflows	265
	Metadata	265
	Data Profiling	265
22:	Global IDs	267
	Data Profiling	268
	Data Quality	269
	Metadata	270

23:	IBM	271
	Metadata	272
	Information Integration	272
	Data Quality	272
	Master Data Management	273
	Data Lifecycle Management	273
	Privacy and Security	274
24:	Informatica	275
	Data Profiling and Data Quality	275
	Metadata and Business Glossary	277
	Master Data Management	277
	Information Lifecycle Management	277
	Security and Privacy	278
	Cloud	278
25:	Orchestra Networks	279
	Workflows	279
	Data Modeling	280
	Master Data Management	282
	Reference Data Management	283
	Business Glossary	283
26:	SAP	285
	An In-Memory Database	286
	Data Quality and Metadata Management	286
	Master Data Management	287
	Content Management	287
	Information Lifecycle Management	287
	Enterprise Modeling	287
	Data Integration	287
27:	Talend	289
	The Extended Ecosystem	290
	Big Data	291
	Data Integration	291
	Data Quality	291
	Master Data Management	291

	Enterprise Service Bus (ESB)	292
	Business Process Management (BPM)	292
28:	Notable Vendors	293
	Adaptive	293
	BackOffice Associates	293
	Data Advantage Group	293
	Diaku	294
	Embarcadero Technologies	294
	Global Data Excellence	295
	Harte-Hanks Trillium	295
	Oracle	296
	SAS	296
Ap	pendix A: List of Acronyms	299
Ap	pendix B: Glossary	301
Ap	pendix C: Potential Data Governance Tasks to Be Automated with Tools	319
	Business Glossary	319
	Metadata Management	320
	Data Profiling	320
	Data Quality Management	321
	Master Data Management	321
	Reference Data Management	322
	Information Policy Management	322
	Data Modeling	322
	Data Integration	323
	Analytics and Reporting	323
	Business Process Management	323
	Data Security and Privacy	323
	Information Lifecycle Management	324
	Hadoop and NoSQL	324
	Stream Computing	324
	Text Analytics	324
Ind	lex	325