## Preface

### 1. What Is Data Governance?

- What Data Governance Involves
- Holistic Approach to Data Governance
- Enhancing Trust in Data
- Classification and Access Control
- Data Governance Versus Data Enablement and Data Security
- Why Data Governance Is Becoming More Important
  - The Size of Data Is Growing
  - The Number of People Working and/or Viewing the Data Has Grown Exponentially
  - Methods of Data Collection Have Advanced
  - More Kinds of Data (Including More Sensitive Data) Are Now Being Collected
  - The Use Cases for Data Have Expanded
  - New Regulations and Laws Around the Treatment of Data
  - Ethical Concerns Around the Use of Data

### Examples of Data Governance in Action

- Managing Discoverability, Security, and Accountability
- Improving Data Quality
- The Business Value of Data Governance
  - Fostering Innovation
  - The Tension Between Data Governance and Democratizing Data Analysis
  - Manage Risk (Theft, Misuse, Data Corruption)
  - Regulatory Compliance
- Considerations for Organizations as They Think About Data Governance
- Why Data Governance Is Easier in the Public Cloud
How to Collect Lineage 135  
Types of Lineage 136  
The Fourth Dimension 138  
How to Govern Data in Flight 139  
Policy Management, Simulation, Monitoring, Change Management 141  
Audit, Compliance 141  
Summary 142  

7. **Data Protection** 143  
Planning Protection 143  
  Lineage and Quality 144  
  Level of Protection 145  
  Classification 146  
Data Protection in the Cloud 146  
  Multi-Tenancy 147  
  Security Surface 147  
  Virtual Machine Security 148  
Physical Security 149  
  Network Security 151  
  Security in Transit 151  
Data Exfiltration 153  
  Virtual Private Cloud Service Controls (VPC-SC) 155  
  Secure Code 156  
  Zero-Trust Model 157  
Identity and Access Management 158  
  Authentication 158  
  Authorization 159  
  Policies 160  
Data Loss Prevention 161  
Encryption 162  
Differential Privacy 164  
Access Transparency 165  
Keeping Data Protection Agile 165  
  Security Health Analytics 165  
  Data Lineage 166  
  Event Threat Detection 167  
Data Protection Best Practices 167  
  Separated Network Designs 168  
  Physical Security 168  
  Portable Device Encryption and Policy 170  
  Data Deletion Process 170  
Summary 173
8. Monitoring

What Is Monitoring? 175
Why Perform Monitoring? 176
What Should You Monitor? 179
  Data Quality Monitoring 179
  Data Lineage Monitoring 180
  Compliance Monitoring 182
  Program Performance Monitoring 183
  Security Monitoring 185
What Is a Monitoring System? 187
  Analysis in Real Time 187
  System Alerts 187
  Notifications 187
  Reporting/Analytics 188
  Graphic Visualization 188
  Customization 188
Monitoring Criteria 189
Important Reminders for Monitoring 190
Summary 191

9. Building a Culture of Data Privacy and Security

Data Culture: What It Is and Why It's Important 193
Starting at the Top—Benefits of Data Governance to the Business 194
  Analytics and the Bottom Line 195
  Company Persona and Perception 195
Intention, Training, and Communications 196
  A Data Culture Needs to Be Intentional 197
  Training: Who Needs to Know What 197
Beyond Data Literacy 200
  Motivation and Its Cascading Effects 200
Maintaining Agility 201
  Requirements, Regulations, and Compliance 202
  The Importance of Data Structure 202
  Scaling the Governance Process Up and Down 203
Interplay with Legal and Security 203
  Staying on Top of Regulations 204
  Communication 204
  Interplay in Action 204
  Agility Is Still Key 205
Incident Handling 205
  When “Everyone” Is Responsible, No One Is Responsible 205
Importance of Transparency 206
What It Means to Be Transparent 206
Building Internal Trust 206
Building External Trust 207
Setting an Example 208
Summary 208

A. Google’s Internal Data Governance ................................................... 209

B. Additional Resources ................................................................. 217

Index ......................................................................................... 219