

## CONTENTS

Figures & Tables	x
Note from the Publisher on the Second Edition	xiii
Foreword to the Second Edition: Nicole Forsgren	xvii
Foreword to the First Edition: John Allspaw	xix
Preface	xxi
Introduction	xxix

### Part I—The Three Ways

Part I Introduction	3
01 Agile, Continuous Delivery, and the Three Ways	7
NEW Case Study: Approaching Cruising Altitude: American Airlines' DevOps Journey (Part 1) (2020)	15
02 The First Way: The Principles of Flow	19
NEW Case Study: Flow and Constraint Management in Healthcare (2021)	29
03 The Second Way: The Principles of Feedback	33
NEW Case Study: Pulling the Andon Cord at Excella (2018)	39
04 The Third Way: The Principles of Continual Learning and Experimentation	45
NEW Case Study: The Story of Bell Labs (1925)	54
Part 1 Conclusion	57

### Part II—Where to Start

Part II Introduction	61
05 Selecting Which Value Stream to Start With	63
Case Study: Nordstrom's DevOps Transformation (2014–2015)	63
NEW Case Study: Kessel Run: The Brownfield Transformation of a Mid-Air Refueling System (2020)	69
NEW Case Study: Scaling DevOps Across the Business:	

American Airlines' DevOps Journey (Part 2) (2020)	74
<b>NEW Case Study:</b> Saving the Economy From Ruin (With a Hyperscale PaaS) at HMRC (2020)	77
<b>06 Understanding the Work in Our Value Stream, Making it Visible, and Expanding it Across the Organization</b>	<b>81</b>
Case Study: Nordstrom's Experience with Value Stream Mapping (2015)	81
Case Study: Operation InVersion at LinkedIn (2011)	91
<b>07 How to Design Our Organization and Architecture with Conway's Law in Mind</b>	<b>97</b>
Case Study: Conway's Law at Etsy (2015)	98
Case Study: API Enablement at Target (2015)	112
<b>08 How to Get Great Outcomes by Integrating Operations into the Daily Work of Development</b>	<b>115</b>
Case Study: Big Fish Games (2014)	115
<b>NEW Case Study:</b> Better Ways of Working at Nationwide Building Society (2020)	124
<b>Part II Conclusion</b>	<b>129</b>

### **Part III—The First Way: The Technical Practices of Flow**

Part III Introduction	133
<b>09 Create the Foundations of Our Deployment Pipeline</b>	<b>135</b>
Case Study: Enterprise Data Warehouse (2009)	135
<b>NEW Case Study:</b> How a Hotel Company Ran \$30B of Revenue in Containers (2020)	143
<b>10 Enable Fast and Reliable Automated Testing</b>	<b>147</b>
Case Study: Google Web Server (2005)	148
<b>11 Enable and Practice Continuous Integration</b>	<b>167</b>
Case Study: HP LaserJet Firmware (2006)	168
Case Study: Continuous Integration of Bazaarvoice (2012)	173
<b>12 Automate and Enable Low-Risk Releases</b>	<b>177</b>
Case Study: Daily Deployments at CSG International (2013)	181
Case Study: Etsy—Self-Service Developer Deployment: An Example of Continuous Deployment (2014)	186
Case Study: Dixons Retail—Blue-Green Deployment for Point-of-Sale System (2008)	193



Case Study: Dark Launch of Facebook Chat (2008)	198
<b>NEW Case Study:</b> Creating a Win-Win for Dev & Ops at CSG (2016)	201
<b>13 Architect for Low-Risk Releases</b>	207
Case Study: Evolutionary Architecture at Amazon (2002)	212
Case Study: Strangler Fig Pattern at Blackboard Learn (2011)	215
Part III Conclusion	219

### **Part IV—The Second Way: The Technical Practices of Feedback**

Part IV Introduction	223
<b>14 Create Telemetry to Enable Seeing and Solving Problems</b>	225
Case Study: DevOps Transformation at Etsy (2012)	226
Case Study: Creating Self-Service Metrics at LinkedIn (2011)	237
<b>15 Analyze Telemetry to Better Anticipate Problems and Achieve Goals</b>	245
Case Study: Telemetry at Netflix (2012)	245
Case Study: Auto-Scaling Capacity at Netflix (2012)	251
Case Study: Advanced Anomaly Detection (2014)	255
<b>16 Enable Feedback So Development and Operations Can Safely Deploy Code</b>	259
Case Study: Right Media (2006)	259
Case Study: The Launch and HandOff Readiness Review Google (2010)	269
<b>17 Integrate Hypothesis-Driven Development and A/B Testing into Our Daily Work</b>	273
Case Study: Hypothesis-Driven Development at Intuit, Inc. (2012)	273
Case Study: Doubling Revenue Growth through Fast Release Cycle Experimentation at Yahoo! Answers (2010)	278
<b>18 Create Review and Coordination Processes to Increase Quality of Our Current Work</b>	281
Case Study: Peer Review at GitHub (2011)	281
<b>NEW Case Study:</b> From Six-Eye Principle to Release at Scale at Adidas (2020)	286
Case Study: Code Reviews at Google (2010)	290

Case Study: Pair Programming Replacing Broken Code Review Processes at Pivotal Labs (2011)	293
Part IV Conclusion	299

## Part V—The Third Way: The Technical Practices of Continual Learning and Experimentation

Part V Introduction	303
19 Enable and Inject Learning into Daily Work	305
Case Study: AWS US-East and Netflix (2011)	305
<b>NEW Case Study:</b> Turning an Outage into a Powerful Learning Opportunity at CSG (2020)	318
20 Convert Local Discoveries into Global Improvements	321
Case Study: Standardizing a New Technology Stack at Etsy (2010)	332
<b>NEW Case Study:</b> Crowdsourcing Technology Governance at Target (2018)	333
21 Reserve Time to Create Organizational Learning and Improvement	335
Case Study: Thirty-Day Challenge at Target (2015)	335
Case Study: Internal Technology Conferences at Nationwide Insurance, Capital One, and Target (2014)	342
Part V Conclusion	347

## Part VI—The Technological Practices of Integrating Information Security, Change Management, and Compliance

Part VI Introduction	351
22 Information Security Is Everyone's Job Every Day	353
Case Study: Static Security Testing at Twitter (2009)	360
Case Study: 18F Automating Compliance for the Federal Government with Compliance Masonry (2016)	369
Case Study: Instrumenting the Environment at Etsy (2010)	373
<b>NEW Case Study:</b> Shifting Security Left at Fannie Mae (2020)	376
23 Protecting the Deployment Pipeline	379



---

Case Study: Automated Infrastructure Changes as Standard Changes at Salesforce.com (2012)	383
Case Study: PCI Compliance and a Cautionary Tale of Separating Duties at Etsy (2014)	385
<b>NEW Case Study:</b> Biz and Tech Partnership toward Ten "No Fear Releases" Per Day at Capital One (2020)	387
Case Study: Proving Compliance in Regulated Environments (2015)	389
Case Study: Relying on Production Telemetry for ATM Systems (2013)	392
<b>Part VI Conclusion</b>	<b>395</b>
A Call to Action: Conclusion to <i>The DevOps Handbook</i>	397
Afterword to the Second Edition	401
Appendices	409
Bibliography	423
Notes	441
Index	461
Acknowledgments	481
About the Authors	484