Table of Contents

Introduction p.1

- About This Book p. 1
- Foolish Assumptions p. 2
- Icons Used in This Book p. 2
- Beyond the Book p. 3
- Where to Go from Here p. 3
- Part 1 Getting Started with Blockchain p. 5
- Chapter 1 Introducing Blockchain p. 7
- Beginning at the Beginning: What Blockchains Are p. 7
- What blockchains do p. 8
- Why blockchains matter p. 9
- The Structure of Blockchains p. 10
- Blockchain Applications p. 11
- The Blockchain Life Cycle p. 11
- Consensus: The Driving Force of Blockchains p. 12
- Blockchains in Use p. 14
- Current blockchain uses p. 14
- Future blockchain applications p. 15
- Chapter 2 Picking a Blockchain p. 17
- Where Blockchains Add Substance p. 17
- Determining your needs p. 18
- Defining your goal p. 19
- Choosing a Solution p. 19

Drawing a blockchain decision tree p. 21

Making a plan p. 22

Chapter 3 Getting Your Hands on Blockchain p. 25 Diving into the Bitcoin Blockchain p. 25 Creating your first Bitcoin wallet p. 25 Creating a second Bitcoin wallet p. 27 Generating a Bitcoin vanity address p. 27 Transferring your vanity address p. 28 Making an entry into the Bitcoin blockchain p. 29 Reading a blockchain entry in Bitcoin p. 29 Using Smart Contracts with Bitcoin p. 30 Building your first smart bond p. 31 Checking the status of your contract p. 33 Building a Private Blockchain with Docker and Ethereum p. 34 Preparing your computer p. 34 Building your blockchain p. 36 Part 2 Developing Your Knowledge p. 39 Chapter 4 Beholding the Bitcoin Blockchain p. 41 Getting a Brief History of the Bitcoin Blockchain p. 42 Debunking Some Common Bitcoin Misconceptions p. 45 Bitcoin: The New Wild West p. 47 Fake sites p. 47 No, you first! p. 47 Get-rich-quick schemes p. 48 Mining for Bitcoins p. 48

Making Your First Paper Wallet p. 49 Chapter 5 Encountering the Ethereum Blockchain p. 51 Exploring the Brief History of Ethereum p. 52 Ethereum: The Open-Source World Wide Computer p. 53 Decentralized applications: Welcome to the future p. 54 The power of decentralized autonomous organizations p. 54 Hacking a Blockchain p. 57 Understanding smart contracts p. 58 Discovering the cryptocurrency Ether p. 58 Getting Up and Running on Ethereum p. 59 Mining for ether p. 59 Setting up your Ethereum wallet p. 60 Building Your First Decentralized Autonomous Organization p. 60 Test net and congress p. 61 Governance and voting p. 62 Uncovering the Future of DAOs p. 63 Putting money in a DAO p. 63 Building smarter smart contracts p. 64 Finding bugs in the system p. 64 Chapter 6 Regarding the Ripple Blockchain p. 65 Getting a Brief History of the Ripple Blockchain p. 66 Ripple: It's All About Trust p. 67 Seeing How Ripple Differs from Other Blockchains p. 68 Unleashing the Full Power of Ripple p. 71 Exercising Caution with Ripple p. 72

Chapter 7 Finding the Factom Blockchain p. 75

A Matter of Trust p. 76

The purpose of the Factom blockchain: Publishing anything p. 77

Incentives of federation p. 78

Building on Factom p. 81

Authenticating documents and building identities using APIs p. 81

Getting to know the Factoid: Not a normal token p. 81

Anchoring your application p. 82

Publishing on Factom p. 82

Building transparency in the mortgage industry p. 84

Verifying physical documents: dLoc with Factom p. 86

Chapter 8 Digging into DigiByte p. 89

Getting Familiar with DigiByte: The Fast Blockchain p. 90

Mining on DigiByte p. 91

Signing Documents on DigiByte's DiguSign p. 94

Earning DigiBytes While Gaming p. 95

Part 3 Powerful Blockhain Platforms p. 97

Chapter 9 Getting Your Hands on Hyperledger p. 99

Getting to Know Hyperledger: Dreams of a Hyper Future p. 100

Focusing on Fabric p. 101

Building your system in Fabric p. 102

Diving into chaincode development p. 102

Investigating the Iroha Project p. 104

Introducing Sumeragi: The new consensus algorithm p. 104

Developing mobile apps p. 105

Diving into Sawtooth Lake p. 106 Exploring the consensus algorithm: Proof of Elapsed Time p. 107 Deploying Sawtooth p. 107 Chapter 10 Applying Microsoft Azure p. 109 Bletchley: The Modular Blockchain Fabric p. 109 Cryptlets for encrypting and authenticating p. 111 Utility and Contract Cryptlets and CrytoDelegates p. 112 Building in the Azure Ecosystem p. 113 Getting Started with Chain on Azure p. 114 Installing Chain's distributed ledger p. 115 Creating your own private network p. 115 Using financial services on Azure's Chain p. 116 Deploying Blockchain Tools on Azure p. 116 Exploring Ethereum on Azure p. 116 Cortana: Your analytics machine learning tool p. 117 Visualizing your data with Power Bl p. 117 Managing your access on Azure's Active Directory p. 118 Chapter 11 Getting Busy on IBM Bluemix p. 119 Business Blockchain on Bluemix p. 119 Your isolated environment p. 120 Bluemix use cases p. 121 Watson's Smart Blockchain p. 122 Building Your Starter Network on Big Blue p. 124 Part 4 Industry Impacts p. 129 Chapter 12 Financial Technology p. 131

Hauling Out Your Crystal Ball: Future Banking Trends p. 131 Moving money faster: Across borders and more p. 133 Creating permanent history p. 134 Going International: Global Financial Products p. 135 Border-free payroll p. 136 Faster and better trade p. 137 Guaranteed payments p. 138 Micropayments: The new nature of transactions p. 138 Squeezing Out Fraud p. 139 Chapter 13 Real Estate p. 141 Eliminating Title Insurance p. 141 Protected industries p. 142 Consumers and Fannie Mae p. 144 Mortgages in the Blockchain World p. 144 Reducing your origination costs p. 145 Knowing your last-known document p. 145 Forecasting Regional Trends p. 146 The United States and Europe: Infrastructure congestion p. 147 China: First out of the gate p. 148 The developing world: Roadblocks to blockchain p. 148 Chapter 14 Insurance p. 151 Precisely Tailoring Coverage p. 151 Insuring the individual p. 152 The new world of micro insurance p. 153 Witnessing for You: The Internet of Things p. 154

IoT projects in insurance p. 155 Implications of actionable big data p. 155 Taking Out the Third Party in Insurance p. 156 Decentralized security p. 156 Crowdfunded coverage p. 156 The implications of DAO insurance p. 157 Chapter 15 Government p. 159 The Smart Cities of Asia p. 159 Singapore satellite cities in India p. 161 China's big data problem p. 162 The Battle for the Financial Capital of the World p. 163 London's early foresight p. 163 The regulatory sandbox of Singapore p. 164 The Dubai 2020 initiative p. 165 Bitlicense regulatory framework: New York City p. 167 Securing the World's Borders p. 168 The Department of Homeland Security and the identity of things p. 168 Passports of the future p. 169 The new feeder document p. 169 Chapter 16 Other Industries p. 171 Lean Governments p. 171 Singapore's Smart Nation project p. 172 Estonia's e-Residency p. 173 Better notarization in China p. 174 The Trust Layer for the Internet p. 174

Spam-free email p. 175

- Owning your identity p. 176
- Oracle of the Blockchain p. 176
- Trusted authorship p. 177
- Intellectual property rights p. 177
- Part 5 The Part of Tens p. 179
- Chapter 17 Ten Free Blockchain Resources p. 181
- Factom University p. 181
- Ethereum 101 p. 182
- Build on Ripple p. 182
- Programmable Money by Ripple p. 182
- DigiKnow p. 183
- Blockchain University p. 183
- Bitcoin Core p. 183
- Blockchain Alliance p. 183
- Multichain Blog p. 184
- HiveMind p. 184
- Chapter 18 The Ten Rules to Never Break on the Blockchain p. 185
- Don't Use Cryptocurrency or Blockchains to Skirt the Law p. 185
- Keep Your Contracts as Simple as Possible p. 186
- Publish with Great Caution p. 187
- Back Up, Back Up, Back Up Your Private Keys p. 187
- Triple-Check the Address Before Sending Currency p. 189
- Take Care When Using Exchanges p. 189
- Beware Wi-Fi p. 190

Identify Your Blockchain Dev p. 190

Don't Get Suckered p. 190

Don't Trade Tokens Unless You Know What You're Doing p. 191

Chapter 19 Ten Top Blockchain Projects p. 193

The R3 Consortium p. 193

T ZERO: Overstocking the Stock Market p. 194

Blockstream's Distributed Systems p. 195

OpenBa/aar's Blockchain p. 196

Code Valley: Find Your Coder p. 196

Bitfury's Digital Assets p. 197

Any Coin Can ShapeShift p. 198

Machine-Payable Apps on 21 p. 198

Anonymous Transactions on Dash p. 199

ConsenSys: Decentralized Applications p. 200

Index p. 201