Content

Preface 14

List of Authors 18

1 AI Changes the Perspective: Defining Tasks, Perceiving Processes, and Understanding Data in a Different Way 42

1.1 Accurate Predictions – Far-reaching Consequences 44

1.2 Data – from a Means to an End to an End in Itself 46

1.3 Knowledge Work in Transition 49

1.4 AI Arrives in Management 52

1.5 Developing Skills and Applications 56

1.6 Conclusion 57

Internet Sources 58

2 Building AI-based Systems: a Blueprint for AI Applications 60

2.1 No Actual Development without the Right Experts 63

2.2 Without Data No Data-driven Applications 67

2.3 Requirements Must be Clear 70

2.4 Roll Up Your Sleeves and Start Building 71

2.5 In the End, it Gets Serious Again . . 72

2.6 Conclusion 73

Literature 73

3 Interaction Room – the Room where AI Applications are Born 74

3.1 Identifying AI Use Cases and Planning their Implementation . . . 75

3.2 Giving Projects Space 76

3.3 IR:AI in Practice 80

3.4 Conclusion 81

4 On the Way to Becoming a Data-driven Company 82
4.1 The Value of Data 84
4.2 Using a Data Strategy to Become a Data-driven Company 88
4.3 Towards a Modern Data Platform using Functional Architecture 90
4.4 Implementing a Data Platform 93
4.5 Conclusion 97
Literature 97
Internet Sources 97

5 AI in Manufacturing: Data – the Material, from which Products are Made . . . 98
5.1 A Sector Unlike Any Other 100
5.2 About the Real and the Digital and AI in Between 103
5.3 The All Importance of Data 106
5.4 "All theory, dear friend, is grey . . ." (Johann Wolfgang von Goethe) 108
5.5 Use Cases 112
5.5.1 Research and Development (R&D) 112
5.5.2 Production 114
5.5.3 Supply Chain Management (SCM) 116
5.5.4 Sales/After-Sales 118
5.6 Conclusion 121
Literature 122

6 AI in the Financial Sector: Reaching Customers Differently, Thinking Processes Differently 124
6.1 A Special Business Sector 126
6.2 AI Applications in Sales 128
6.2.1 Automated Sales 128
6.2.2 Evaluating Enquiries Automatically 131
6.3 AI Applications in Process Optimisation 132
6.4 AI Applications in Service 133
6.4.1 A Voice Assistant as "The Right Hand" 133

6.4.2 A Banking Expert Made of Bits and Bytes 135
6.5 Conclusion 139

7 AI in Insurance – More Satisfied Customers, Less Fraud, Better Processes 140
7.1 AI in Insurance Sales 142
7.2 Artificial Intelligence in Fraud Detection 145
7.2.1 Insurance Fraud: a Victimless Crime? 145
7.2.2 Status quo of Software-supported Fraud Detection 146
7.2.3 Rule-based Systems as the Basis for AI 147
7.2.4 Machine Learning Approaches 147
7.2.5 Explainable AI as an Enabler of Supervisory Compliance 150
7.2.6 Crystal Ball Gazing 153
7.3 Use Case *Barmenia*: Classification of Texts with Techniques of "Very Deep Learning" – Distributing Emails Intelligently 154
7.3.1 Usage of Neural Networks .. 155
7.3.2 Word Processing 155
7.3.3 Training AI 157
7.4 Conclusion 159
Literature 159
Internet Sources 160

8 AI in Retail: the Sixth Sense for Decision Makers and Customers 162
8.1 Is Online an Advantage? 164
8.2 The Flow of Data helps the Flow of Goods 166
8.3 Individual Communication on a Large Scale 168
8.4 New Experiences in Retail: the Virtual Scent Sample 172
8.5 Conclusion 175

9 AI in Medicine: New Possibilities, New Procedures, New Challenges 176
9.1 Data – a Tool for Medical Professionals 179
9.2 New Technologies are Changing the Healthcare Market 183
9.3 Changes in Approving AI-based Medical Devices 184
9.4 Conclusion 191
Literature 191
Internet Sources 191

10 AI in the Energy Industry: the Grid is Getting Smarter 192
10.1 The "Energiewende" 193
10.2 Data Move Energy 196
10.3 Smart City and Neighbourhoods: Intelligence in the City and the Grid 198
10.4 Intelligent Charging Station Concepts 200
10.5 5G, Blockchain and AI 202
10.6 Conclusion 203
Literature 203
Internet Sources 204

11 AI in Public Administration: in Search of Technology that Serves Society 206
11.1 The Starting Point 208
11.2 The Challenges 211
11.3 Possible Solutions 215
11.4 Conclusion: Overcoming the Specific "Federal Hurdles" in the German Context 220
Internet Sources 221

12 AI in Customer Experience Management: Actual Experiences with AI 222
12.1 One Cannot Copy Experiences 224
12.2 Data and Experiences 227
12.3 AI in Action – Example: Sports Equipment 228
12.4 AI Creates New Insights 231
12.5 AI Has an Effect on all Processes .. 233
12.6 The Plan for a Data-driven Communication 235

12.7 Conclusion 237
Internet Source 237

13 AI in Mobile Applications: AI to Go 238
13.1 Images, Context, Language – the Mobile Triad 240
13.2 Comparing Apples and Androids .. 241
13.3 Intelligence in the Device or the Cloud 246
13.3.1 AI-driven Mobile Information Management 248
13.3.2 Mobile AI Supports Patients with Depression in Dealing with their Disease 249
13.3.3 Mobile Occupational Safety and Health with AI 251
13.3.4 AI Supports Barrier-free Information Access 253
13.4 AI Helps where it Hurts: Dull, Dirty, Dangerous 255
13.5 Conclusion 255

14 AI in Communication: Automate, Personalise, Communicate Better 258
14.1 Data is the Key to Communication 260
14.2 Opportunities across All Sectors .. 262
14.3 Consistency in Diversity 266
14.4 Digital Experience Content Process 268
14.5 Conclusion 272

15 AI Out-of-the-box: Intelligent Services for more Straightforward AI Projects 274
15.1 AI as a Service 276
15.2 Opportunities Using AIaaS 277
15.3 Risks and Side Effects 281
15.4 AI Services and the Role of Data Scientists 283
15.5 Conclusion 285
Internet Sources 285

16 Integrating Chatbots into Communication – "Hello, can you understand me?" 286
16.1 Chatbots Understand their Part of the World Step by Step 288
16.2 The Toolbox for Building Chatbots 291
16.3 Conclusion 295

17 AI in IT Operations: Extending, Enriching or Replacing IT Support with AIOps Solutions 298
17.1 Challenges for Companies when Integrating AIOps Platforms 301
17.2 Machine Learning Components in AIOps 303
17.3 Use Cases and Benefits of Using AIOps 305
17.3.1 Intelligent Alarms Based on Correlating Events and Analysing Root Causes 305
17.3.2 Anomaly Detection and Threat Identification 306
17.3.3 Optimisation of IT Service Management Processes 306
17.4 AI in the IT Security Sector 307
17.5 Procedure Plan for AIOps Projects 308
17.6 Conclusion 308
Internet Sources 309

18 How AI is Shaping the Workplace of Tomorrow 310
18.1 Modern Work in Companies – Status Quo of "New Work" 311
18.2 An Overview of the Possibilities and Limits of AI's Cognitive Capabilities 312
18.2.1 Recognising Information in Images and Videos 313
18.2.2 Understanding Texts Using Text Mining 316
18.2.3 Speech-to-Text & Text-to-Speech 318
18.2.4 Detecting Anomalies in Time Series 318
18.3 How AI is Already Influencing the Workplace Today 319
18.3.1 Decision Making 319

18.3.2 Selecting Suitable Employees Using Automation during the Application Process 320
18.3.3 Robots Taking over High-risk Jobs 321
18.3.4 Automating Communication Using Human-like Avatars . 322
18.3.5 Improved Perception and Collaboration Using Mixed Reality 323
18.4 Changing Competence Profiles in the Workplace Using Cognitive Systems 325
18.5 Conclusion 327
Internet Sources 327

19 A Survey Among Decision-makers and End-customers on the Topic of AI: Between Enthusiasm and Fear of Contact 330
19.1 AI & the End-customers: No Fear, but Curiosity Among Germans 333
19.2 AI & Decision-makers: AI is Happening – but Top Management is not Always on Board 335
19.3 AI & Decision-makers: the Pressure from Digital Competition is Smaller than Anticipated 339
19.4 AI & Decision-makers: the Smaller, the Further Away from the Cloud 341
19.5 Decision-makers and End-consumers: “Fancy a Chatbot?” ... 343
19.6 Conclusion 346

Glossary 348

Index 350