

ERIC SCHAEFFER

# Industry X.0

Realizing Digital Value in Industrial Sectors

**REDLINE** | VERLAG



© des Titels »Industry X.0« (978-3-86881-654-9)  
2016 by RedlineVerlag, Münchner Verlagsgruppe GmbH, München  
Nähere Informationen unter: <http://www.redline-verlag.de>

# Table of Contents

|   |    |
|---|----|
| Preface .....   | 11 |
| Acknowledgments .....   | 15 |
| Introduction .....  | 17 |
| Beyond the Product: Outcomes and Value .....                          | 17 |
| Two Battlegrounds, Trapped Value and Six “No-Regrets” .....           | 19 |
| Fluidity and Data Pervasiveness Across the Enterprise .....           | 21 |
| Innovation in the New and in the Core – Finding the Right Pivot ..... | 23 |
| Tying Together Products, Ecosystems and Platform Products .....       | 24 |
| How to Use This Book .....  | 25 |
| Too Much Will be Lost by Sitting on the Fence .....                   | 27 |

## PART I

|  |    |
|--|----|
| The Industrial Internet of Things – Transforming<br>Manufacturing Beyond Recognition ..... | 29 |
|--|----|

### Chapter 1

---

|   |    |
|---|----|
| Industry’s Ongoing and Accelerating Digital<br>Transformation ..... | 31 |
| The Drivers of Change in the Industrial Sphere .....                | 35 |
| Technology Becomes Affordable and Puts Speed Behind the IIoT .....  | 37 |
| The Value of the IIoT is Still to be Unlocked .....                 | 39 |
| Ecosystems Form Powerful Wells of Innovation .....                  | 40 |
| The Product of Me vs. Mass Manufacturing .....                      | 42 |
| Liquid Fulfillment Networks Will Supplant Old-Style Factories ..... | 43 |
| The Critical Importance of Preparing the Digital Workforce .....    | 45 |
| The Surprisingly Slow Embrace of the IIoT by Business .....         | 46 |
| Takeaways .....   | 51 |

## Chapter 2

---

|  |    |
|--|----|
| How the IIoT Leads to the Outcome Economy .....                    | 53 |
| New Tech Creates New Business Models.....                          | 56 |
| Living Products or the Reinvention of the Product .....            | 58 |
| Outcome Orientation Spurs Innovation in Products and Services..... | 60 |
| Outcomes are Appearing Across Sectors .....                        | 62 |
| The Why Behind the Buy .....                                       | 64 |
| From Rigid Business Silos to Agile Ecosystems .....                | 65 |
| New Risks and Rewards.....   | 68 |
| The Four Future Stages of Industry .....                           | 70 |
| Takeaways .....  | 76 |

## Chapter 3

---

|   |     |
|---|-----|
| Digital Super Value – A Guiding Light<br>for Digital Strategy ..... | 77  |
| Two Speeds Create Massive Value Deposits.....                       | 82  |
| The Societal Benefits .....   | 83  |
| What’s in it for Business? .....                                    | 87  |
| Automotive – the Vanguard Efficiency Seekers.....                   | 90  |
| How to Find the Right Pivots .....                                  | 97  |
| Takeaways .....   | 100 |

## PART II

|  |     |
|--|-----|
| How to Make the Most of the<br>Digital Industrial Transformation ..... | 101 |
|--|-----|

## Chapter 4

---

|  |     |
|--|-----|
| Six “No-Regret” Capabilities –<br>the Journey Towards Digital, Mapped out Simply ..... | 103 |
| From Old World to New World on Many Different Paths .....                              | 105 |

|   |     |
|---|-----|
| Be Adaptive and Relaxed but Curious and Visionary – and Get Going . . .   | 109 |
| Design Thinking Speeds up Service Development Processes . . . . .         | 111 |
| The Six Fundamental Capabilities that Can Get your Digitization Started . | 114 |
| Your IIoT Business – How to Succeed . . . . .                             | 121 |
| To Take Services to Market, Think Big, Start Small, Scale Fast. . . . .   | 122 |
| Takeaways . . . . .   | 124 |

## Chapter 5

---

### Zoom in: How to Make

|  |     |
|--|-----|
| Data Analytics Work Your Way . . . . .                                     | 127 |
| Raw Data Has no Value and Needs Enrichment . . . . .                       | 129 |
| Which Data Strategy to Pursue – More Return from Inside or Outside?..      | 131 |
| The Five Sources of Value that Can be Tapped with a Data Strategy. . . . . | 133 |
| IoT Lead Generation – Anticipate your Customers’ Demand . . . . .          | 135 |
| From Mere Monitoring to a Real Predictive Maintenance Practice . . . . .   | 138 |
| Data Analytics Strategy – the New Industrial Must-Have . . . . .           | 139 |
| Gains to Make Now in a Changing Landscape . . . . .                        | 141 |
| How Utility Businesses Harness Big Data Analytics . . . . .                | 144 |
| Keep Pilots Incremental and Focused . . . . .                              | 145 |
| Flexible Data Analytics as a Service and Edge Computing . . . . .          | 147 |
| Practically Connecting the Digital Factory . . . . .                       | 150 |
| Wherever you Start, Work Along a Roadmap for More . . . . .                | 152 |
| Takeaways . . . . .  | 155 |

## Chapter 6

---

### Zoom in: How to Handle

|   |     |
|---|-----|
| Digital Product Development . . . . .                             | 157 |
| From Connected Products to Digitized Product Development. . . . . | 160 |
| Digitizing PLM End-to-End – the Main Challenge . . . . .          | 165 |
| The Stepped Road to Future-Proofed DPLM . . . . .                 | 172 |
| Digital PLM already Generates Value for Real Businesses . . . . . | 176 |

|  |     |
|--|-----|
| Choose the Right Speed for Changing Processes and People . . . . .     | 179 |
| Electronics and High-Tech Pointing the Way for Industry . . . . .      | 181 |
| Mobile Phone Functionality Gives Manufacturers a Major Steer . . . . . | 182 |
| The Problem of Beating the Clock – How and Which One of the Many? .    | 184 |
| Takeaways . . . . .  | 188 |

## Chapter 7

---

|  |            |
|--|------------|
| <b>Zoom in: How to Create<br/>a Connected Industrial Workforce . . . . .</b> | <b>189</b> |
| Mutuality Between Humans and Machines Across the Whole Enterprise .          | 193        |
| Low-Supervision Shop-Floor Machine-Centricity – It’s Nearly Here . . . .     | 194        |
| The Path to Collaborative Robots Running Enterprises . . . . .               | 196        |
| A Fully Connected Workforce Needs New Organizational Structures . . . .      | 199        |
| Connected Workers Must Iterate, Adapt, and be Flexible . . . . .             | 201        |
| Managerial Trust Issues Around Machines . . . . .                            | 204        |
| Managers Must do More Strategic Judgment Work . . . . .                      | 206        |
| Under-Appreciated Intelligent Machines . . . . .                             | 208        |
| Corporate HR’s Need for a Strategic Stance . . . . .                         | 209        |
| Takeaways . . . . .  | 212        |

## Chapter 8

---

|  |            |
|--|------------|
| <b>Zoom in: How to Master Innovation in the New . . . . .</b>              | <b>215</b> |
| Old-Style Innovators See Only the Market’s Supply Side . . . . .           | 219        |
| “Build it and They Will Come” vs. “Let Them Come and We Will Build it” . . | 220        |
| The First Boosts From Innovation in the New . . . . .                      | 222        |
| Four Innovator Types, One Long-Term Winner . . . . .                       | 223        |
| Brilliant Innovators Lead the Way in the Industrial Sector . . . . .       | 226        |
| Digitally-Driven Innovation Makes all the Difference . . . . .             | 229        |
| Four Recommendations for Becoming a Reinventor . . . . .                   | 230        |
| Incubator Mentalities and Capabilities Round off Future Innovation . . . . | 233        |
| Takeaways . . . . .  | 238        |

## Chapter 9

---

|  |     |
|--|-----|
| <b>Zoom in: How to Make the Most of Platforms and Ecosystems</b> ..... | 241 |
| What is an Ecosystem and Why Build One? .....                          | 243 |
| Leveraging Start-ups .....   | 246 |
| Building an Ecosystem – How to Do it .....                             | 249 |
| The Emerging Power of Platforms .....                                  | 252 |
| From Transaction Hubs to Innovation Machines .....                     | 255 |
| Platforms as “Tissue” .....  | 257 |
| Three Stages of Maturity .....   | 259 |
| Gently Disassembling to Make Way for New Business Models .....         | 262 |
| Asset-Heavy vs. Asset-Light .....                                      | 263 |
| Five Things to Watch out for When Building Platforms .....             | 265 |
| Takeaways .....  | 267 |

## PART III

|   |     |
|---|-----|
| <b>The Future is Now and Tomorrow</b> ..... | 269 |
|---|-----|

## Chapter 10

---

|  |     |
|--|-----|
| <b>A Visionary Outlook – The Digital Industrial Enterprise</b> ..... | 271 |
| In the Pull Economy, Meet the Production Crowd .....                 | 274 |
| Technology Makes Making More Flexible .....                          | 278 |
| Nothing as Usual Becomes Business as Usual .....                     | 283 |
| <b>Chapter Takeaways at a Glance</b> .....                           | 285 |
| <b>Glossary of Terms</b> .....                                       | 293 |
| <b>Endnotes</b> .....  | 295 |
| <b>Index</b> .....   | 309 |
| <b>About the Author</b> .....  | 313 |