Book Reviews

Heartificial Intelligence. 2016. John C. Havens. New York, NY: Tarcher/Penguin. 267 pages.

At the 35th Annual ASQ Boston Conference (BOSCON) in April, the first day featured several presenters (including myself) who emphasized the emerging significance of artificial intelligence (AI) in quality management. Smart manufacturing and the industrial Internet of Things (IoT) are already in place; even cars, particularly if they have been purchased within the past two years, are complex, intelligent machines that frequently makes decisions on one's behalf. In 2015, "deep learning" (neural networks with thousands of layers that make it possible to accurately detect patterns in complex data sets in an almost magical way) went from a curiosity to a proven industrial algorithm, which will accelerate the incorporation of AI into more business processes.

When AI has a dominant role in business processes, it will also play a featured role in quality systems. As a result, it is important for all quality managers to begin learning about this field now, and John C. Havens' *Heartificial Intelligence* is a great place to begin. He provides a very readable introduction to the issues associated with value-driven implementation of AI and, in fact, probably provides the *first* treatment of AI from this perspective.

Each chapter starts with a story about some fictional scenario that takes place 15 to 20 years in the future. The first few are dystopian, while the later stories are inspiring and hopeful, which will appeal to all readers. Every story illustrates approximately three primary ideas. The stories integrate interviews with researchers and specialists, and solid explanations of the philosophical and ethical constructs that motivate the author's conclusions. For example, chapter 9 describes the learning process for a kitchen assistant robot as it is trained to behave in alignment with different human values. The assistant faces a challenge: there is no chicken available in the house, and the robot needs chicken for the recipe it is trying to cook. Should the kitchen assistant use the catbot for meat? Although this is a silly example, it is *memorable*, and it accentuates the need to design human values into AI-intensive systems. Designing quality into next-generation systems will *require* designing human values into AI in the same way that this, and the other stories in this book, describe.

Havens concludes that "the journey of identifying your humanity starts with tracking your values." Rather than just stating this as an aphorism, he provides concrete recommendations for *how* one can start doing this. Although he does not address how to scale this process to the organizational level, his work provides the idea and theoretical foundation for value tracking as a central component of business intelligence programs.

Reviewed by
Nicole M. Radziwill

Throwing Rocks at the Google Bus: How Growth Became the Enemy of Prosperity. 2016. Douglas Rushkoff. New York, NY: Portfolio/Penguin. 278 pages.

If the global economy was a massive computer, what would its operating system look like? Rushkoff uses this metaphor to organize an extremely well-researched argument in which he essentially makes three points:

1. The economy is "programmed" to promote growth above all else, particularly human well-being, despite the obvious evidence that a growth mentality is proving disastrous.
2. The historical path by which people arrived at this point is relatively clear, meaning the consequences of failing to change course now are both predictable and severe.
3. People have the theoretical and technological competence to forge a new economy based on "digital distributism," a framework that sustainably serves people and the planet.

Modern human economies have passed through three eras, and are entering a fourth. The Artisanal Era (CE 1000-1300) saw the emergence of a middle class centered around local markets in which craftspeople built highly personalized webs of value based in the products and services they provided to their neighbors. The Industrial Era (CE 1300-1990) birthed artifacts such as centralized currency, stock markets, time-based employment, mass production, and the grow-or-die mentality. This era was catalyzed by nobility striving to retain power, which was waning due to the growing artisanal class. While certainly a time of phenomenal innovation, the resulting entrenched bifurcation of society into "haves" and "have nots" was intentional—a "feature" rather than a "bug." The Digital Industrial Era (CE 1990-2015) saw the linear growth of the Industrial Era become exponential as a result of computers.

If the last 25 years have taught us anything, it is that the current mode of operation is unsustainable. Rushkoff's vision of the new era, which he calls "digital distributism" is both compelling and possible. His entire narrative is thoroughly grounded not only in well-established academic literature, but also by his extensive personal experience inside Silicon Valley startup culture. He echoes and builds on the excellent work in Charles Eisenstein's 2011 book, *Sacred Economics*. While not citing Eisenstein directly, these books are complementary and draw from the same deep well of understanding about the nature of the economy and whom it is programmed to serve.

Whether the reader is an executive responsible for charting the course of a company, a young innovator building his or her first startup, or just an individual looking to maximize the positive impact of his or her own investments, this is an extraordinarily readable, practical, and highly recommended guide to fixing the economy's broken operating system.

Reviewed by
Morgan C. Benton

Failure Mode and Effects Analysis (FMEAs) for Small Business Owners and Non-Engineers. 2016. Marcia W. Weeden. Milwaukee, WI: ASQ Quality Press. 248 pages.

It is always interesting to see how a book presents a topic that it claims is addressed to an atypical audience. That is what this book purports to do: educate nonengineers about the reliability engineering tool failure mode and effects analysis (FMEA). I was particularly interested in this book because in a previous job, I had done exactly that; used FMEA as a decision-making tool to address what would happen if the organization did not execute courses of action.

The book is simple and straightforward enough to accomplish its primary objectives. It uses the standard ASQ Quality Press formatting, and sections are conceptually organized into small, bite-size pieces. For a new person who is being introduced to the subject, the format may be comforting. I particularly like how the author recommends using a team approach, completing the FMEA as if it were an improvement project where multiple perspectives can be leveraged to provide synthesis. Unfortunately, I don't know if small business owners have the luxury of this type of approach, so this audience may have to make adjustments to apply the techniques that are recommended.

The section where the author explains that the scales used to calculate the risk priority number are arbitrary and should be customized to the organization conducting the study, was particularly strong. There are numerous examples of different types of scales in the book; a better explanation of how to develop new scales targeted to particular business needs could have strengthened this presentation.

The FMEA worksheet used in the book is also in a different format from the typical examples found in ASQ certification primers or the AIAG guide. The information is the same. All in all, this is a good first book for someone unfamiliar with the practical elements of the FMEA process. For improvement neophytes, the book will gently walk them through the process. Once the reader becomes more comfortable with the power of the FMEA tool, however, I envision that they will look for other references to

supplement their knowledge and to go more deeply into the material.

Reviewed by
Scott Rutherford

A Six Sigma Approach to Sustainability: Continual Improvement for Social Responsibility. 2016. Holly A. Duckworth and Andrea Hoffmeier. Boca Raton, FL: CRC Press/Taylor & Francis Group. 225 pages.

Although continuous improvement and social responsibility have been written about extensively, there are few texts that address the data-driven pursuit of sustainable and socially responsible outcomes. This book begins the important process of defining a discipline around data-driven process improvement efforts that focus on sustainability.

The book has, as its conceptual foundation, the ISO 26000:2010 Guidance on Social Responsibility, which is placed into practical context often. This is a strength of the approach. The centerpiece of this book, however, is SOFAIR, a problem-solving methodology with six steps: 1) stakeholder/subject analysis; 2) objective; 3) function/focus; 4) analyze; 5) improve/innovate; and 6) report/repeat. The authors say "it is cautioned not to use DMAIC to solve social responsibility problems," and provide examples where they claim that SOFAIR is more effective as a problem-solving methodology.

Chapters 1 and 2 provide general background on continuous improvement, and how the Six Sigma DMAIC methodology is used to achieve that end. Chapters 3 and 4 introduce SOFAIR and describe each of its elements. Chapter 5 contains four short case studies on how to use this philosophy to achieve sustainability objectives, and chapter 6 provides examples that give a cursory introduction to how SOFAIR can be applied, but may not provide enough depth for readers to be able to immediately apply the approach to their own organization's social responsibility challenges.

For readers who are already familiar with the kinds of improvement projects that are specific to social responsibility, this book may provide a helpful framework to ensure that Six Sigma tools and techniques are consistently applied. For others, the book may not provide enough information about what specific defects or sources of variation can be reduced to improve social responsibility objectives.

Reviewed by
Nicole M. Radziwill