

1. Record Nr.	UNINA9910573101103321
Autore	Tarantino Anthony <1949->
Titolo	Smart manufacturing : the lean Six Sigma way / / Anthony G. Tarantino
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , [2022] ©2022
ISBN	1119846641 1119846625 1119846633
Descrizione fisica	1 online resource (466 pages)
Disciplina	658.5620218
Soggetti	Manufacturing processes - Automation Six sigma (Quality control standard)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Title Page -- Contents -- Foreword -- Acknowledgments -- About the Author -- About the Contributors -- Introduction -- Chapter 1 Introduction to Industry 4.0 and Smart Manufacturing -- Introduction -- The First Industrial Revolution -- The Second Industrial Revolution -- The Third Industrial Revolution -- The Fourth Industrial Revolution -- The Major Components of Smart Manufacturing -- Lean and Six Sigma in the Age of Smart Manufacturing -- Improving Cybersecurity Using Smart Technology -- Smart Logistics -- Big Data for Small, Midsize, and Large Enterprises -- Industrial IoT Sensors -- Artificial Intelligence Machine Learning and Computer Vision -- Networking for Mobile-Edge Computing -- Additive Manufacturing and 3D Printing -- Robotics -- Smart Technology to Improve Life on the Factory Floor -- Summary: The Advantages of Smart Manufacturing -- Improved Quality and Safety -- Improved Margins -- Improved Cycle Times -- High Efficiency with Well-Defined Smart Factory Processes23 -- Sample Questions -- Notes -- Chapter 2 Lean Six Sigma in the Age of Smart Manufacturing -- Introduction -- The History of Lean - American Assembly Lines -- The History of Lean - Toyota Embraces Deming and Piggly Wiggly -- The Toyota Production System: The Birthplace of Lean -- Lean Empowers Employees, Treating Them with Respect -- Resilient

Supply Chain Management: How Toyota Fared During the COVID-19 Pandemic -- The History of Six Sigma: Bill Smith and Jack Welch -- Six Sigma's DMAIC Framework to Fix an Existing Process -- The DMAIC Framework Using Smart Technologies -- Six Sigma's DMADV Framework to Design a New Process -- The Statistics Behind Six Sigma -- Six Sigma Professionals in the Age of Smart Manufacturing -- Six Sigma Project Charters and SMART Goals -- Lean and Six Sigma Uses of the Scientific Method -- Summary: Six Sigma's Marriage to Lean. Sample Questions -- Notes -- Chapter 3 Continuous Improvement Tools for Smart Manufacturing -- Introduction -- Voice of the Customer in the Age of Smart Manufacturing -- Voice of the Customer Using Net Promoter Score -- Voice of the Customer Using the Delphi Technique -- Voice of the Customer Using the Kano Model -- Affinity Diagrams to Organize Many Ideas into Common Themes -- Critical to Quality to Convert the VOC to Measurable Objectives -- Types of Data -- Benchmarking -- Process Maps -- Types of Process Maps -- SIPOC -- Process Maps with Decision Points -- Process Maps with Swim Lanes -- Limited Data Collection and the Hawthorne Effect Impacting Process Mapping -- Value Stream Maps to Eliminate Waste -- Value-Added Activity versus Non-Value-Added Activity -- Root Cause Analysis Using a Fishbone Diagram and Risk Matrix -- Root Cause Analysis Using the Five Whys -- Changes Coming to Root Cause Analysis with Smart Technologies -- Pareto Chart -- Kanban Pull System -- Poka-Yoke to Error-Proof Processes and Products -- Five S -- Heijunka -- Plan-Do-Check-Act -- Kaizen -- Setup Time Reduction Using Single Minute Exchange of Dies -- Gage Repeatability and Reproducibility (Gage R&R) -- Failure Modes and Effects Analysis (FMEA) to Solve Complex Problems -- Pugh Matrix to Design New Processes and Products -- Quality Function Deployment (House of Quality) -- History of QFD -- Structure of the House of Quality Used in QFD -- Building a House of Quality -- Benefits of Using QFD -- Using QFD in Combination with the Pugh Matrix -- Smart Technologies to Automate QFD -- Summary -- Sample Questions -- Notes -- Chapter 4 Improving Supply Chain Resiliency Using Smart Technologies -- Introduction -- Supply Chain Resilience -- Supply Chain Risk Heat Maps -- Supply Chain Mapping at a Macro and Micro Level -- Preferred Supplier Programs. Bill of Material Risk Grading Tools -- Environmental Risk Solutions -- The Global Driver Shortage and Poor Utilization -- Vehicle Monitoring Tools -- Computer Vision Systems Using Smart Cameras -- Autonomous Trucks -- Supply Chain Resiliency in a Post-COVID World -- Criticism and Defense of Lean Inventory Management -- Good Sourcing Strategies -- Supply Chain Stress Testing -- Summary -- Sample Questions -- Notes -- Chapter 5 Improving Cybersecurity Using Smart Technology -- Introduction -- Trends Increasing the Risk of Manufacturing and Supply Chain Cyberattacks -- Globalization and Specialization -- Improved Security Within the Corporate Network -- Artificial Intelligence and the Internet of Things -- Software Supply Chain Compromises -- The Emergence of Cloud Computing and the Public Cloud -- Targeting Small Companies -- So Why Is Manufacturing and the Supply Chain an Attractive Target? -- Primary Motives Behind Manufacturing and Supply Chain Attacks -- Stealing Proprietary Information and Intellectual Property -- Financial Gain from Ransomware -- Political Motives -- Disruption of Operations -- Methods Used to Breach Target Systems -- Using a Third-Party Connection as a Means to Get to Your Network -- Using a Third-Party Connection as a Means to Get to Your Customers' Information -- Tampering with Components or Products in the Manufacturing Process

-- Tampering with Manufacturing Process Equipment -- What Are the Potential Costs of a Cyberattack? -- Protecting Against Cyberattacks -- Approaches to Mitigating Risk -- Developing Internal Processes and Controls -- Developing Secure Third-Party Relationships -- Summary -- Sample Questions -- Notes -- Chapter 6 Improving Logistics Using Smart Technology -- Introduction: Why Logistics? -- Megatrends in Logistics That Impact Brands/Manufacturers. The Different Expectation of Your Customer-by-Customer Type -- The Cost of Not Paying Attention to Logistics -- The Benefits of Making Logistics a Strategic Competency -- Steps to Make Logistics Your Competitive Advantage -- Why Technology Is So Important to Logistics -- Area 1: Insight/Planning/Monitoring -- Area 1, Use Case 1: Logistics Insight via Data Analytics -- Area 1, Use Case 2: Advanced Forecasting via Machine Learning and AI-Based Prediction -- Area 1, Use Case 3: Dynamic Decision-Making via Machine Learning and AI-Based Prediction with Real-Time Data and Blockchain -- Area 2: Task Execution -- Area 2, Use Case 1: Automation for Information Processing via Robotics Process Automation -- Area 2, Use Case 2: Automation for Physical Tasks via Robotics -- Area 2, Use Case 3: Autonomous Transportation via Autonomous Technologies -- Area 3: Exchanges and Collaborations -- Area 3, Use Case 1: Digital Freight Brokerage via Cloud Technologies -- Area 3, Use Case 2: Supply Chain Collaboration via Cloud Technologies -- Area 4: Safety, Security, and Compliance -- Area 4, Use Case 1: Global Trade Compliance via Cloud Technologies -- Summary -- Sample Questions -- Notes -- Chapter 7 Big Data for Small, Midsize, and Large Operations -- Introduction -- Structured Data and Relational Databases -- Unstructured Data -- Why Manufacturing Needs Big Data Analytics -- The Four Levels of Data Analytics -- Descriptive Analytics - What Happened? -- The Five Phases of Descriptive Analytics -- The Value of Descriptive Analytics -- Diagnostic Analytics - Why Did It Happen? -- Predictive Analytics - What May Have Happened? -- Prescriptive Analytics - What Is the Best Next Step? -- Future of Big Data Analytics -- Data Science Tools -- Data Analytics Pipeline -- Collection -- The Benefits of Big Data for SMEs -- Big Data Tools for SMEs. Problems SMEs Face in Adopting Big Data Analytics -- Best Practices in Data Analytics for SMEs -- Summary -- Sample Questions -- Notes -- Chapter 8 Industrial Internet of Things (IIoT) Sensors -- Introduction -- PLCs -- Carnegie Mellon -- Consumer-Oriented IoT -- Webcams -- IIoT-Enabling Technologies -- IIoT Platform Building Blocks -- IIoT Sensors -- Application Areas for IIoT -- Industries Where IIoT Can and Does Play a Role -- Future Trends in IIoT -- Summary -- Sample Questions -- Notes -- Chapter 9 Artificial Intelligence, Machine Learning, and Computer Vision -- Introduction -- History of AI and Computer Vision -- Understanding Machine Learning and Computer Vision -- Types of Machine Learning -- Common Computer Vision Tasks -- Building a Model -- Machine Learning Pipelines -- Issues with Artificial Intelligence -- Conclusion -- Sample Questions -- Notes -- Chapter 10 Networking for Mobile Edge Computing -- Introduction -- Brief History of Networking -- Basic Networking Concepts, Architecture, and Capabilities -- Network Address Management -- Subnets -- Network Address Translation -- Ports -- Autoconfiguration of Networks -- Security and Reliability -- Introduction to the OSI Model -- Basic Wi-Fi Concepts, Architecture, and Capabilities -- Mobile Cell Phone Concepts, Architecture, and Capabilities -- Mobile Generations -- Cell Architectural Concepts -- Mobile Networking Security and Reliability -- Future Evolution of Mobile Networking -- IT and Telecommunications Networking Convergence -- Convergence of the

Internet and Telephony -- Capabilities and Benefits of Mobile Edge
Networking -- Summary -- Sample Questions -- References -- Popular
Acronyms Used in Networking and Mobile Computing -- Notes --
Chapter 11 Edge Computing -- Introduction: What Is Edge Computing?
-- Benefits of Edge Computing -- Top Use Cases for the Edge in Smart
Manufacturing.
The Data Challenge.
