

1. Record Nr.	UNINA9911019435003321
Autore	Sahu Atul Kumar
Titolo	Industrial and Manufacturing Designs : Quantitative and Qualitative Analysis
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2024 ©2024
ISBN	9781394212668 1394212666 9781394212651 1394212658
Edizione	[1st ed.]
Descrizione fisica	1 online resource (423 pages)
Altri autori (Persone)	RautRakesh D RajaRohit SahuAnoop Kumar SahuNitin Kumar
Disciplina	745.2
Soggetti	Manufacturing processes Industrial engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Series Page -- Title Page -- Copyright Page -- Contents -- Preface -- Chapter 1 Demonstrating the Role of Qualitative and Quantitative Information in Industrial and Manufacturing Designs -- 1.1 Introduction -- 1.2 Literature Review -- 1.3 Decision-Making (DM) and Framework -- 1.4 Directory of Cases -- 1.4.1 Role of Qualitative or Quantitative Criteria Toward Solar Panel Evaluation -- 1.4.1.1 Summary and Discussions Toward Evaluating Solar Panels -- 1.4.2 Role of Qualitative or Quantitative Criteria Toward Optimization of Automatic/Robotic Welding Systems -- 1.4.2.1 Summary and Discussions Toward Evaluating Welding System -- 1.4.3 Role of Qualitative or Quantitative Criteria Toward Selection of Smart Alloys and Materials -- 1.4.3.1 Summary and Discussions Toward Selection of Smart Alloys and Materials -- 1.4.4 Role of Qualitative or Quantitative Criteria Toward Logistic Service Provider Evaluation -- 1.4.4.1 Summary and Discussions Toward Evaluation of Logistic Service Provider -- 1.4.5

Role of Qualitative or Quantitative Criteria Toward Machine Tool Evaluation -- 1.4.5.1 Summary and Discussions Toward Evaluation of Machine Tool -- 1.4.6 Role of Qualitative or Quantitative Criteria Toward Industrial Robot Selection -- 1.4.6.1 Summary and Discussions Toward Selection of Industrial Robot -- 1.5 Critical Aspects -- 1.6 Implication and Discussions -- 1.7 Conclusions -- References -- Chapter 2 Sustainable Supply Chain Management Practices in Developing Economies: A Qualitative Mapping Approach -- 2.1 Introduction -- 2.2 Literature Review -- 2.2.1 Sustainable Supply Chain Management -- 2.2.2 Sustainable Supply Chain Management Practices -- 2.2.3 Challenges of Integrating SSCM -- 2.2.4 Strategies for Enhancing SSCM Integration -- 2.3 Methodology -- 2.3.1 Data Collection -- 2.3.2 Data Analysis -- 2.4 Results -- 2.4.1 SSCM Practices.

2.4.1.1 Green Packaging -- 2.4.1.2 Green Production -- 2.4.1.3 Stakeholder Engagement -- 2.4.1.4 Supplier Collaboration -- 2.4.1.5 Risk Mitigation -- 2.4.1.6 Social Sustainability -- 2.4.1.7 Innovative Infrastructure and Technology Systems -- 2.4.2 SSCM Challenges -- 2.5 Discussion on Results -- 2.6 Conclusion and Recommendations -- References -- Chapter 3 Advocating Lean Practices and Strategies in Decision-Making for Reinforcing Industrial and Manufacturing Designs -- 3.1 Introduction -- 3.2 Literature Review -- 3.3 Lean Tools, Motivation, and Methodology -- 3.4 Lean Theory and Practices -- 3.4.1 Lean Practices (Segment 1) -- 3.4.1.1 Value Stream Mapping (VSM) -- 3.4.1.2 Kaizen -- 3.4.1.3 5S -- 3.4.1.4 KANBAN -- 3.4.1.5 Six Sigma -- 3.4.1.6 Total Productive Maintenance (TPM) -- 3.4.1.7 Total Quality Management (TQM) -- 3.4.1.8 Overall Equipment Effectiveness (OEE) -- 3.4.1.9 Plan-Do-Check-Act (PDCA) -- 3.4.1.10 Inventory Management -- 3.4.1.11 Production Leveling -- 3.4.1.12 Zero Defect (ZD) Concept -- 3.4.1.13 Bottleneck Analysis (BA) -- 3.4.1.14 Root Cause Analysis (RCA) -- 3.4.1.15 Just in Time (JIT) -- 3.4.1.16 Time and Motion Study -- 3.4.1.17 Single-Minute Exchange Dies (SMED) -- 3.4.1.18 DMAIC -- 3.4.1.19 Poka-Yoke -- 3.4.2 Lean Practices (Second Segment) -- 3.4.2.1 Redundancy -- 3.4.2.2 Digitalization -- 3.4.2.3 Health, Safety, and Allowance for Continuous Flow -- 3.4.2.4 Simplification and Standardization -- 3.4.2.5 Teamwork and Partnering -- 3.5 Lean Strategy: Discussions and Implications -- 3.6 Lean-Based Case Investigations and Discussions -- 3.6.1 Lean Manufacturing is a Vital Tool to Enhance Productivity in Manufacturing -- 3.6.2 The Linkage Between Lean and Sustainable Manufacturing for Attaining Refined Performance -- 3.6.3 A Conceptual Model of Lean Manufacturing Dimensions for Sustainability.

3.6.4 Lean Practices Align Toward the Health and Safety of Workers in Manufacturing Industries (MIs) -- 3.6.5 The Linkage Between Lean and Agile Manufacturing for Work-In-Progress (WIP) Control -- 3.6.6 Adaptations of Lean Practices in SMEs to Support Industry 4.0 in Manufacturing -- 3.6.7 Implementation of Lean Practices in the Water Heater Manufacturing Industry for Value Adding -- 3.6.8 Lean Practices in Indian Machine Tool Industries for Receiving Productivity -- 3.6.9 Lean Manufacturing (LM) Practices for Influencing Process-Based Innovation and Performance -- 3.6.10 The Implementation of Lean Manufacturing in the Furniture Industry -- 3.6.11 Implementation of Lean Manufacturing in the Electronics Industry -- 3.7 Modeling of Lean Under Industrial and Manufacturing Sphere -- 3.7.1 Lean Modeling in Manufacturing Industries -- 3.7.2 Lean Modeling in Academic Institutes -- 3.7.3 Lean Modeling in Managerial Structure and Service-Related Organizations -- 3.7.4 Lean Modeling in Social Fields -- 3.7.5 Lean Modeling in Environmental Science -- 3.7.6 Lean Modeling in

Economics -- 3.7.7 Lean Modeling in the Automobile Industry -- 3.8  
Conclusions -- References -- Chapter 4 A Qualitative Study to Rank  
Non-Conventional Energy Sources for Industrial Sustainability and  
Energy Management Decisions Using MoSCoW Prioritization Method --  
4.1 Introduction -- 4.1.1 Major Non-Conventional Energy Sources --  
4.1.1.1 Solar Energy -- 4.1.1.2 Wind Energy -- 4.1.1.3 Hydroelectric  
Power -- 4.1.1.4 Biomass Energy -- 4.1.1.5 Geothermal Energy --  
4.1.1.6 Tidal and Wave Energy -- 4.1.1.7 Hydrogen Fuel Cells -- 4.1.2  
Significance of Non-Conventional Energy Source -- 4.1.2.1  
Environmental Benefits -- 4.1.2.2 Energy Security -- 4.1.2.3 Economic  
Benefits -- 4.1.2.4 Resource Sustainability -- 4.1.2.5 Climate Change  
Mitigation -- 4.1.2.6 Technological Advancement.  
4.1.3 Scope of Non-Conventional Energy in Industrial Sustainability --  
4.1.4 Problem Formulation -- 4.1.5 Objectives of Chapter -- 4.1.6  
Methodology of Chapter -- 4.1.7 Organization of Chapter -- 4.2  
Review of Literature -- 4.2.1 Solar Energy -- 4.2.2 Wind Energy --  
4.2.3 Hydropower -- 4.2.4 Biomass and Bioenergy -- 4.2.5 Geothermal  
Energy -- 4.2.6 Tidal and Wave Energy -- 4.3 Current Scenario of Non-  
Conventional Sources in Industrial Sustainability -- 4.3.1 Wind Energy  
-- 4.3.2 Hydroelectric Power -- 4.3.3 Biomass Energy -- 4.3.4  
Geothermal Energy -- 4.3.5 Tidal and Wave Energy -- 4.3.6 Hydrogen  
Fuel Cells -- 4.3.7 Energy Storage -- 4.3.8 Policy and Regulation --  
4.3.9 Integration and Grid Management -- 4.4 Overview of Indian Non-  
Conventional Energy Sector -- 4.4.1 SWOT Analysis of Non-  
Conventional Energy Sources -- 4.4.1.1 Strength -- 4.4.1.2  
Weaknesses -- 4.4.1.3 Opportunity -- 4.4.1.4 Threats -- 4.4.2 Energy  
Management Decision in Indian Context -- 4.5 Qualitative Analysis  
Using MoSCoW Method -- 4.5.1 Research Design -- 4.5.2 Renewable  
Energy Technology Dimensions Based on Industrial Sustainability --  
4.5.3 MoSCoW Prioritization Approach -- 4.5.4 Results -- 4.6  
Discussion -- 4.7 Conclusion -- 4.7.1 Limitations -- 4.7.2 Further  
Avenues -- References -- Chapter 5 Response Surface Methodology: A  
Statistical Tool to Optimize Process Parameters (Quantitative Data) to  
Maximize the Microbial Biomass and Their Bioactive Metabolites -- 5.1  
Introduction -- 5.2 Conventional Methods for Multifactor Experimental  
Design -- 5.2.1 Full Factorial Design -- 5.2.2 Fractional Factorial  
Design -- 5.2.3 One-Factor-at-a-Time (OFAT) Design -- 5.2.4 Central  
Composite Design (CCD) -- 5.2.5 Box-Behnken Design -- 5.2.6  
Taguchi Method -- 5.2.7 Latin Square Design -- 5.3 Response Surface  
Methodology (RSM) -- 5.4 RSM in Bioprocessing/Fermentation.  
5.4.1 RSM for Antibiotic Production from Microorganisms -- 5.4.2 RSM  
in Enzyme Production -- 5.4.3 RSM for Bioethanol Production -- 5.4.4  
RSM in Biosurfactant Production -- 5.4.5 RSM in Heavy Metal Pollution  
Elimination -- 5.5 Role of Quantitative Data in RSM -- 5.6 Conclusion  
-- References -- Chapter 6 Evaluating Mass-Spring-Damper Systems  
and Models for Reinforcing Engineering Designs: A Qualitative and  
Quantitative Approach -- 6.1 Introduction -- 6.2 Extensive Review of  
Existing Optimization Models for Mass Damper Systems -- 6.3 Use of  
Mass Damper Systems: Active and Passive -- 6.4 Brief Review of  
Optimization Models for Mass Damper Systems -- 6.4.1 Modal  
Analysis-Based Optimization -- 6.4.2 Optimization in the Frequency  
Domain -- 6.4.3 Time-Domain Optimization -- 6.4.4 Multi-Objective  
Optimization -- 6.5 Algorithm of Particle Swarm Optimization (PSO) --  
6.6 Benefits of Optimizing Mass Damper Systems -- 6.6.1 Vibration  
Reduction -- 6.6.2 Maintenance and Repair Costs -- 6.6.3 Health and  
Well-Being -- 6.6.4 Repercussions for the Natural World -- 6.7 Role of  
Qualitative Optimization and Discussions -- 6.7.1 Language of the  
Developer -- 6.7.2 Conceptual Understanding -- 6.7.3 Trade-Off

Analysis -- 6.7.4 Identifying Critical Factors -- 6.7.5 Non-Linear Effects -- 6.7.6 Sensitivity to Assumptions -- 6.7.7 Incorporating Practical Constraints -- 6.7.8 Iteration and Iterative Learning -- 6.7.9 Interdisciplinary Collaboration -- 6.7.10 Communication with Stakeholders -- 6.7.11 Risk Assessment and Mitigation -- 6.8 Conclusion -- References -- Chapter 7 A Fuzzy Decision Optimization of Wire-EDM Process for Reinforcing Manufacturing Design Under Quantitative Data -- 7.1 Introduction -- 7.2 Review of Literature -- 7.3 The Significant Facts Related to Design, Implementation, and Importance of Total Productive Maintenance Programs in Manufacturing Operations.  
7.4 Primary Objectives.

---

#### Sommario/riassunto

This book, 'Industrial and Manufacturing Designs: Quantitative and Qualitative Analysis', offers an in-depth exploration of the roles that qualitative and quantitative analysis play in industrial and manufacturing design processes. Edited by experts in the fields of industrial engineering, information technology, and mechanical engineering, it provides comprehensive insights into various methodologies and frameworks. The book addresses topics such as sustainable supply chain management, lean manufacturing practices, energy management, and the optimization of industrial processes. It is intended for an audience of professionals, academics, and students in industrial engineering and related fields, aiming to enhance their understanding of contemporary practices and strategies in manufacturing design.

---