

TABLE OF CONTENTS

Introduction	pag.	9
1. Lean Manufacturing and Sustainability: Exploring Their Relationship and the Impact of Lean Tools on Sustainability Pillars through Two Systematic Literature Reviews	»	13
1.1. Introduction	»	13
1.2. Conceptual Framework	»	16
1.2.1. Lean Manufacturing	»	16
1.2.2. Sustainability Pillars	»	19
1.3. Research Methodology	»	21
1.3.1. Planning the Review	»	21
1.3.2. Conducting the Review	»	23
1.3.3. Reporting the Review	»	26
1.4. Results of the First Systematic Literature Review – SLR 1	»	27
1.4.1. Publication Trends Over Time	»	27
1.4.2. Publication Geographical Distribution, Journal and Citation Analysis	»	28
1.4.3. Document Types and Keyword Analysis	»	32
1.4.4. Research Methods, Industry Sectors, and Geographical Applications	»	34
1.4.5. Evaluating the Integration of Lean and Sustainability Across Pillars and Sectors	»	36
1.4.6. Synergies between Lean and Sustainability Pillars	»	38
1.5. Results of the Second Systematic Literature Review – SLR 2	»	40

1.5.1. Publication Trends Over Time	pag.	40
1.5.2. Publication Geographical Distribution, Journal and Citation Analysis	»	41
1.5.3. Document Types and Keyword Analysis	»	45
1.5.4. Research Methods, Industry Sectors, and Geographical Applications	»	47
1.5.5. Lean Tools and Impact on Sustainability Dimensions	»	49
1.6. Discussion of the First Systematic Literature Review – SLR 1	»	59
1.7. Discussion of the Second Systematic Literature Review – SLR 2	»	62
1.8. Conclusions	»	65
Appendix - A1	»	67
References	»	90

2. Evaluating the Impact of Lean Techniques on Sustainability Performance in Mechanical Engineering Industry: A Single Case Study Using Sustainable Value Stream Mapping (Sus-VSM)	»	105
2.1. Introduction	»	105
2.2. Research Methodology	»	108
2.3. Case Study Results	»	113
2.3.1. Company Profile	»	113
2.3.2. Selection of Sustainability Metrics	»	114
2.3.3. Assessment of Straightener Production Line Pre- and Post-Implementation of Lean Project	»	123
2.3.3.1. Mapping of Production Flow	»	123
2.3.3.2. Measurement of Economic Sustainability Metrics	»	125
2.3.3.3. Measurement of Environmental Sustainability Metrics	»	127
2.3.3.4. Measurement of Social Sustainability Metrics	»	130
2.4. Discussion	»	144
2.5. Conclusions	»	146
Appendix - A2	»	148
References	»	167

3. Adoption of Lean Manufacturing in Italian Mechanical Engineering Industry: Impacts on Sustainability and Barriers to Implementation	pag.	179
3.1. Introduction	»	180
3.2. Research Methodology	»	185
3.2.1. Sampling and Data Collection	»	185
3.2.2. Data processing	»	187
3.3. Results	»	189
3.3.1. Company Profile	»	189
3.3.2. Lean Manufacturing Adopters	»	191
3.3.2.1. Descriptive Statistics	»	191
3.3.2.2. Correlation Analysis between Lean Tools and the Three Pillars of Sustainability	»	202
3.3.3. Lean Manufacturing Non-Adopters	»	215
3.3.3.1. Descriptive Statistics	»	215
3.3.3.2. ANOVA Analysis	»	219
3.3.3.3. Correspondence Analysis	»	223
3.3.3.4. Principal Component Analysis	»	226
3.3.3.5. Logistic Regression	»	229
3.4. Discussion	»	232
3.5. Conclusions	»	238
Appendix - A3	»	239
References	»	254
Conclusions	»	271