

CHAPTER 12

Enhancing Production Performance using Sustainable Lean Supply Chain: A Case Study in an Indonesian Shoes Manufacturer

Raditya Abyudaya PUTRA

Department of Industrial Engineering, Faculty of Industrial Technology, Universitas Trisakti, Jakarta, Indonesia
raditya063001800058@std.trisakti.ac.id

Emelia SARI

Department of Industrial Engineering, Faculty of Industrial Technology, Universitas Trisakti, Jakarta, Indonesia
Corresponding author: emelia@trisakti.ac.id
Orcid: 0000-0002-0029-1931

Parwadi MOENGIN

Department of Industrial Engineering, Faculty of Industrial Technology, Universitas Trisakti, Jakarta, Indonesia
parwadi@trisakti.ac.id
Orcid: 0000-0001-8250-7590

Ridha Satria

Interdisciplinary School of Management, Institut Teknologi Sepuluh Nopember, Surabaya, West Java, Indonesia
7032231015@student.its.ac.id
Orcid: 0000-0003-0192-8575

Rahmi MAULIDYA

Department of Industrial Engineering, Faculty of Industrial Technology, Universitas Trisakti, Jakarta, Indonesia
ahmimaulidya@trisakti.ac.id
Orcid: 0000-0003-4868-060X

Mohd Yazid ABU

Faculty of Manufacturing and Mechatronic Engineering Technology,
Universiti Malaysia Pahang Al-Sultan Abdullah, Pahang, Malaysia
myazid@ump.edu.my
Orcid: 0000-0002-6148-6193

ABSTRACT

An Indonesian shoe manufacturing company has collaborated with a German sports apparel manufacturer within the Partner supply chain. However, the company needs help in its supply chain, particularly in material procurement, subcontracting, production, and storage, leading to delays in product delivery and quality issues. These inefficiencies result in waste generation, which harms the supply chain and the environment. To address these issues, this research employs the Sustainable Lean Supply Chain approach to enhance economic, social, and environmental aspects. The research begins by identifying the root causes of the problems by utilizing a fishbone diagram and Sustainable-Value Stream Mapping (SVSM) to visualize the current supply chain flow, encompassing inbound, operational, and outbound processes. The SVSM results are further analyzed using Process Activity Mapping tools to categorize activities into non-value-added, necessary non-value-added, and value-added segments. The Sustainability Index (SI) is then calculated, incorporating economic, social, and environmental indicators. The SVSM mapping of the production operation process reveals a process cycle efficiency (PCE) of 62.34% and a Manufacturing Lead Time (MLT) of 624874.01 seconds. After implementing improvements, the PCE increases to 68.26%, and the MLT decreases to 570736.29 seconds. The SI for inbound, operation, and outbound activities are determined to be 111.02%, 86.01%, and 184.33%, respectively. This research contributes to guiding practitioners in implementing a lean supply chain competitive strategy to enhance the SI. Furthermore, it provides empirical evidence of the positive relationship between a sustainable lean supply chain and sustainable performance, offering valuable insights for academicians and industry practitioners.

Keywords: Lean, Supply Chain, Sustainable-Value Stream Mapping, Shoes Manufacturer.