

Universidad de Lima
Facultad de Ingeniería
Carrera de Ingeniería Industrial



OPERATIONS MODEL BASED ON LEAN MANUFACTURING TO INCREASE THE PERFECT ORDER RATE IN SMEs IN THE CONSOLIDATED FREIGHT DISTRIBUTION SECTOR

Tesis para optar el Título Profesional de Ingeniero Industrial

Luis Angel Zelada Muñoz

Código 20172830

Andrea Cristina Arana Grijalva

Código 20170080

Asesor

Juan Carlos Quiroz Flores

Lima – Perú

Marzo de 2023

OPERATIONS MODEL BASED ON LEAN MANUFACTURING TO INCREASE THE PERFECT ORDER RATE IN SMEs IN THE CONSOLIDATED FREIGHT DISTRIBUTION SECTOR

Luis Angel Zelada-Muñoz

Facultad de Ingeniería y Arquitectura, Universidad de Lima, Perú, 20172830@aloe.ulima.edu.pe

Andrea Cristina Arana-Grijalva

Facultad de Ingeniería y Arquitectura, Universidad de Lima, Perú, 20170080@aloe.ulima.edu.pe

Juan Carlos Quiroz-Flores

Facultad de Ingeniería y Arquitectura, Universidad de Lima, Perú, jcquiroz@ulima.edu.pe

Ezilda María Cabrera-Gil Grados

Facultad de Ingeniería y Arquitectura, Universidad de Lima, Perú, ecabrera@ulima.edu.pe

Abstract

This research develops the validation of an operations model that allows mitigating the root causes of the high rate of imperfect orders within a company dedicated to distributing consolidated cargo of various products in Lima, Peru. It is also possible to confirm that Lean Manufacturing tools optimize the processes of SMEs in the service sector; the implementation of these tools provides positive results in the long term. Not only in the quality of its service but also improves the organizational culture within these companies. This case study used the PDCA methodology supported by the 5S, Jidoka (Poka-Yoke), and Standardized Work to reduce the main problem. To achieve our objective, 5S helped the operator achieve an optimal work environment in our case study warehouse. Jidoka, along with visual management, eliminated picking and counting errors. In addition, standardized work eliminated unnecessary time spent on activities that did not add value to the supply chain process. For the implementation of these tools, pilots of each of them were carried out, and, subsequently, the simulation was performed in the simulation software Arena version 16.1. As a result of the validation, the ratio of perfect orders was increased by 15.98%, and the order preparation time was reduced by 19.95%.

CCS CONCEPTS:

• Applied computing • Operations research • Industry and manufacturing • Supply chain management

Additional Keywords and Phrases:

Lean Manufacturing, 5S, Standardized Work, Jidoka, PDCA, Freight distribution

ACM Reference Format:

Luis Angel Zelada-Muñoz, Andrea Cristina Arana-Grijalva, Juan Carlos Quiroz-Flores and Ezilda María Cabrera-Gil Grados. 2022. Operations model based on Lean Manufacturing to increase the perfect order rate in SMEs in the consolidated freight distribution sector. The 8th International Conference on Industrial and Business Engineering (ICIBE 2022), September 27-29, 2022, Macau, China.

DOI <https://doi.org/10.1145/3568834.3568843>

Paper ICIBE

INFORME DE ORIGINALIDAD

4%

INDICE DE SIMILITUD

3%

FUENTES DE INTERNET

5%

PUBLICACIONES

0%

TRABAJOS DEL ESTUDIANTE

FUENTES PRIMARIAS

1

repositorio.ulima.edu.pe

Fuente de Internet

1%

2

"Human Interaction, Emerging Technologies and Future Applications III", Springer Science and Business Media LLC, 2021

Publicación

1%

3

Guillermo André Laura-Ulloa, Gianella Natalia Chinchay-Morales, Juan Carlos Quiroz-Flores. "Lean model applied to increase the order fulfillment in SMEs in the footwear industry", 2022 The 3rd International Conference on Industrial Engineering and Industrial Management, 2022

Publicación

1%

4

"Proceedings of the 6th Brazilian Technology Symposium (BTSym'20)", Springer Science and Business Media LLC, 2021

Publicación

<1%

5

repositorioacademico.upc.edu.pe

Fuente de Internet

<1%