

PREFACE

All praise be to Allah SWT for His grace, which allowed me to complete this Final Project. This project fulfills the requirements for the undergraduate degree in Industrial Engineering at the Faculty of Industrial Engineering, Telkom University.

My sincere gratitude goes to:

1. **Teddy Sjafrizal B.Eng., M.Sc., Ph.D.** and **Rino Andias Anugraha, S.T., M.M., Ph.D.**, my supervisors, for their guidance, advice, and input throughout the completion of this final project.
2. **Dr. Dida Diah Damayanti, S.T., M.Eng.Sc.**, my academic advisor, for assisting with the execution and planning of my studies.
3. **Hesa Aji Pinayung and Evan Devara**, my final project group mates, for their valuable discussions and support during the completion of this project.
4. **Ika Hartika, Yuliyanto**, and the rest of my family that supported me in every aspect.
5. **Muhammad Khairunnazmi, Muhammad Fariz Dzakira, Kevin Balyan Sionader, Kenneth Matthew Gomulia**, and a teacher in a kindergartener for supporting me emotionally and accompanying me in most of my worst conditions.

Due to my limited knowledge and experience, I acknowledge that there are still many shortcomings in this Final Project. Therefore, I highly appreciate any suggestions and constructive criticism for future improvements.

Bandung, 29 June 2025

The Author