

**ENHANCING PRODUCTION CAPACITY BY LEAN MANUFACTURING
THROUGH DMAIC: A CASE STUDY AT PT XYZ, PRODUCTION LINE A,
SCOOTER TYPE X**

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



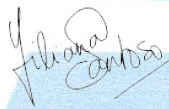
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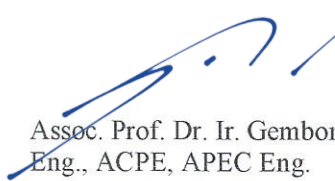


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ABSTRACT

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This study aims to increase production capacity at PT XYZ Line A Type Scooter X by implementing Lean Manufacturing through the DMAIC (Define–Measure–Analyze–Improve–Control) framework. The focus of the study is to identify and address inefficiencies that limit output in a high-volume motorcycle production system. Key Lean tools—such as Ishikawa diagrams, Pareto analysis, and Failure Mode and Effects Analysis (FMEA)—are used to prioritize root causes of waste. Three main problems were identified: waiting due to workload imbalance, overprocessing due to the lack of inspection standards, and product defects due to weak quality control in the upstream process. Corrective actions taken include balancing the process, implementing visual torque standards, and installing quality gates. The results showed improvements: Overall Equipment Effectiveness (OEE) increased from 85.0% to 88.1%, Delivery Achievement increased from 98.3% to 100.0%, and Efficiency Ratio increased from 90.2% to 93.2%, while overtime costs per unit were successfully reduced from approximately 130% to 105–106% of the target. The study concluded that the integration of DMAIC with Lean tools and real-time operational data provides a structured and scalable approach to continuous improvement, and is relevant for application in similar manufacturing environments in Indonesia.

Keywords: Lean Manufacturing, DMAIC, Production Efficiency, OEE, Motorcycle Industry, FMEA



DEDICATION

I dedicate this works for:

1. My family, my parents, my wife and my daughter who always give me love and support to finish this study and works.
2. My advisor and Co-Advisor, always give me guidance and knowledge how to make this works finish on time.



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To my dearest wife and daughter—thank you for being my biggest source of strength and joy. Your love, patience, and unwavering support have meant everything to me. On the toughest days, you reminded me why I started, and on the good ones, you reminded me to be grateful.

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This thesis has been more than just a research project but it's been a journey of learning, growth, and resilience. I'm thankful for every moment, every challenge, and every person who played a part in it.

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