

**REDUCING PRODUCTION COSTS IN MOTORCYCLE MANUFACTURING
THROUGH IMPROVED FUEL UTILIZATION DURING UNIT TESTING
AT FACTORY X: A DESIGN THINKING APPROACH**

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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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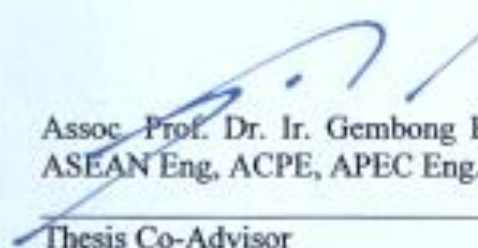
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ABSTRACT

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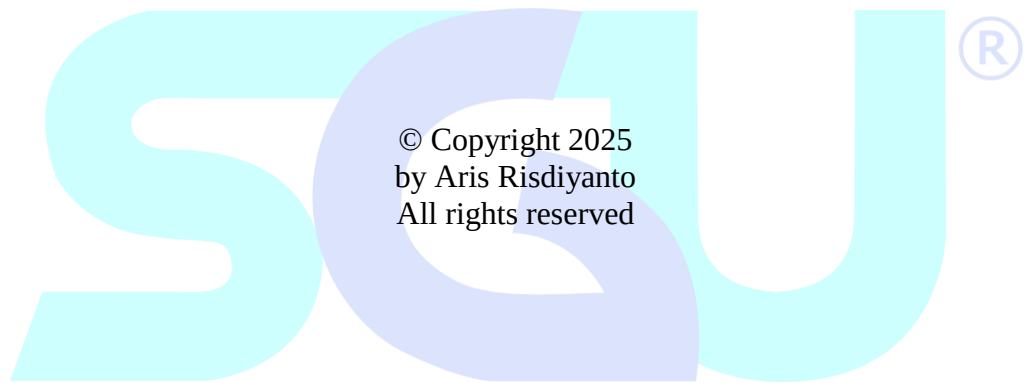
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In this study, fuel consumption during unit-testing of motorcycles at Factory X was optimized using design thinking, a structured and human-centered innovation methodology. The conventional practice of fuel filling was based on estimation, which led to excess usage, waste, and inconsistent ignition performance. The research employed the five stages of design thinking, namely Empathize, Define, Ideate, Prototype and Test, to identify the root causes of behavior, procedure, and technology, and created an ergonomic fuel nozzle prototype consisting of functional and flow mechanics principles. Testing on 22,400 units showed significant reductions in the average fuel consumption from 318.5 ml to 200 ml per unit (37.2% reduction), with successful ignition performance of 99.991%. Annual savings of about 138,645 liters of gasoline (IDR 2.88 billion) were achieved, while the ease of use for operators was improved and rework was reduced. These results demonstrate that it is possible to bridge the gap between human behavior and technical capability, make the process more efficient, and build sustainable cost and process innovations.

Keywords: Design Thinking, fuel optimization, motorcycle manufacturing, prototype, behavioral engineering, root cause analysis



DEDICATION

I dedicate this thesis to my family.

To my parents, thank you for your endless support and prayers.

To my wife, thank you for standing by me.

And to all of my daughter, you're my biggest reason to keep going.



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