

Improving the Capability of LEAN Assembly Line Simulation at Swiss German
University Industrial Engineering Lab

By

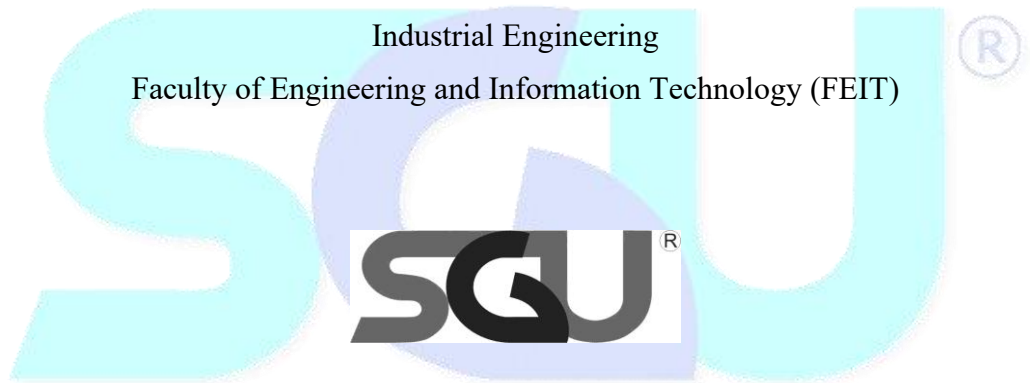
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BACHELOR'S DEGREE

In

Industrial Engineering

Faculty of Engineering and Information Technology (FEIT)



SWISS GERMAN UNIVERSITY

The Prominence Tower

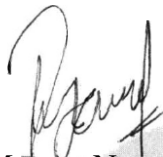
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23rd July 2025

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.

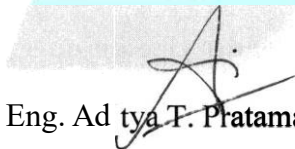


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ABSTRACT

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This thesis examines the limitations of the current LEAN assembly line simulation at the Swiss German University (SGU) laboratory by incorporating infrared (IR) sensors and barcode scanners for better data collection and tracking. The existing simulation still relies on manual data gathering, which can lead to errors and lacks the needed flexibility for effective LEAN analysis. The research suggests using IR sensors to automatically detect product movements and barcode scanners to accurately identify components.

The goal is to improve data accuracy regarding cycle times and inventory management. The thesis will cover the system's design and implementation, including user-friendly data visualization. Additionally, it will assess the improved simulation's effectiveness compared to manual methods and explore its benefits for teaching LEAN concepts and research.



DEDICATION

I dedicate this study for the future of Swiss German University students and lecturers. I also dedicate this study for my parents and friends who gave me endless support and motivation to get to this point. Lastly, I dedicated this thesis to Aminah, for always staying by my side even when I'm through the worst.



ACKNOWLEDGEMENTS

I wish to thank my lecturers especially my advisor and Co advisor Pak Adit for the patience and support during my studies at SGU from the beginning till the end, without all of you I would not be able to finish my study. I wish to thank my family and my friends for the endless encouragement and motivation to help me get back up when I feel down during the making of this thesis.

I have found my coursework throughout the Curriculum and Instruction program to be stimulating and thoughtful, providing me with the tools with which to explore both past and present ideas and issues.



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