

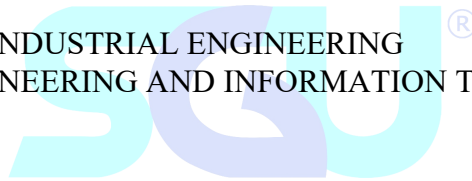
**ENHANCING DIGITALIZATION OF INVENTORY MANAGEMENT: CASE
STUDY OF THE INDUSTRIAL ENGINEERING LABORATORY AT SWISS
GERMAN UNIVERSITY**

By

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BACHELOR'S DEGREE
in

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FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY



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Revision after the Thesis Defense on **1st of 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

ENHANCING DIGITALIZATION OF INVENTORY MANAGEMENT: CASE STUDY OF THE INDUSTRIAL ENGINEERING LABORATORY AT SWISS GERMAN UNIVERSITY

By

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This research aims to enhance the digitalization of inventory management at the Industrial Engineering Laboratory of Swiss German University by developing a custom inventory system using Odoo 17 Community. The current inventory management process still relies heavily on manual entry using Excel and Google Sheets, resulting in inefficiencies, data inconsistencies, and a lack of real-time visibility. The development methodology used in this research is the Waterfall model, consisting of requirement analysis, design, implementation, testing, deployment, and maintenance. Key features include a loan request module, barcode scanning, email automation, product replacement reporting, user access control, and integration with PostgreSQL and Python. Findings from the implementation show a significant improvement in system usability, traceability of loan history, and reduction in human error. The integration of automated email reminders and barcode scanning helped reduce late returns and improved administrative control. The system was tested successfully and received positive feedback from laboratory staff and users. In conclusion, the developed system provides a more structured, efficient, and transparent approach to inventory

management in the academic laboratory setting, supporting both operational needs and future scalability.

Keywords: Inventory Management, Odoo Community, Digitalization, Barcode Scanning, Email Automation





DEDICATION

This thesis is lovingly dedicated to my parents.

To my father, now watching over me from heaven. Thank you for the quiet strength you left behind. Your memory guides my every step, and I still hear your gentle reminder to put education first, no matter how many obstacles appear in the way. To my mother, who stands beside me with unshakable love and patience, your steady encouragement, countless sacrifices, and the same insistence on valuing education have carried me through every long night of study and writing. You are my living example of resilience and grace. Everything I have achieved here is rooted in the lesson you both instilled: knowledge is a light that can never be taken away. With all my heart, I offer this work as a small tribute to your love and to your enduring belief in the power of learning.



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I would also like to extend my thanks to all faculty members and staff of the Industrial Engineering Department at Swiss German University for their academic support and for providing the resources needed during the research. To my beloved mother and the late father who now rests in heaven, thank you for your unconditional love, sacrifices, and for always reminding me to prioritize education. This achievement is a reflection of your values and prayers. Lastly, I am deeply thankful to my close friends and colleagues who stood by me during challenging moments. Your motivation and kindness will always be remembered.

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To my beloved mother and to my late father who now rests in heaven thank you for your unconditional love, sacrifices, and for always reminding me to prioritize education. This achievement is a reflection of your values and prayers. Lastly, I am deeply thankful to my close friends and colleagues who stood by me during trying

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