THE REPUBLIC OF INDONESIA DEFENSE UNIVERSITY

DESIGN OF CYBER LEARNING SYSTEMS USING ODOO ENTERPRISE RESOURCE PLANNING AT THE MILITARY ACADEMY

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This thesis was written to fulfill the requirements
for earning a Master's Degree in Defense Science

FACULTY OF DEFENSE SCIENCE AND TECHNOLOGY

CYBER DEFENSE ENGINEERING STUDY PROGRAM

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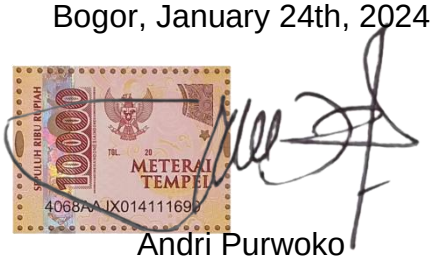

Andri Purwoko

PREFACE

The author expresses profound gratitude to God Almighty, for it is with His blessings and grace that the completion of this thesis on the topic of designing Cyber Learning Systems Using Odoo Enterprise Resource Planning to support practical cyber learning for cadets at the Military Academy was possible.

This thesis is submitted as a requirement for obtaining a Master's degree in the Cyber Security Engineering Program, Faculty of Defense Science and Technology, Defense University. The completion of this thesis was made possible thanks to the assistance and support from various parties, both directly and indirectly. Therefore, on this occasion, the author would like to express thanks to:

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6. All of the researcher's friends whose names cannot be mentioned individually due to space constraints, but are nonetheless not forgotten.

May the Almighty God repay the kindness of all parties for their assistance. The researcher realizes that this thesis is not yet perfect, and therefore humbly welcomes constructive criticism and suggestions to enhance the perfection of this research. Finally, it is hoped that this thesis will contribute to the development of defense science and be beneficial to the related stakeholders.

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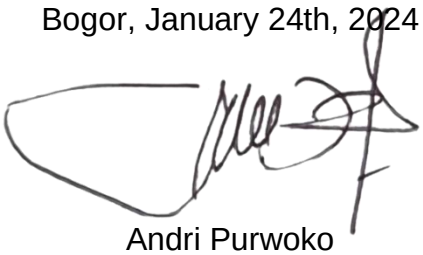

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ABSTRACT

This research investigates the development and implementation of cyber learning systems at the Military Academy using the Odoo ERP platform. The primary objective is to create effective learning methods for Basic Cyber Knowledge, countering the traditional lecture-dominant curriculum and integrating the latest educational technology. The study not only develops relevant learning materials but also introduces interactive and practical learning techniques through a comprehensive cyberlearning platform.

Key to this study is the development of SQL Injection materials within the Odoo ERP-based cyberlearning system. Odoo is chosen for its versatility in material integration and external source collaboration through PostgreSQL database, enabling tailor-made content for the Academy's specific cyber training needs.

The methodology involves designing and testing the cyberlearning system with 200 Military Academy cadets. They were divided into two groups: one with traditional methods and the other with the new system. Effectiveness was measured using a T-test, analyzing pre- and post-test scores, material comprehension time, learning satisfaction, and SQL Injection task success.

The T-test results showed a substantial difference in material comprehension time (p-value = 5.45e-36), highlighting the need for learning methods enabling quicker, more efficient understanding. Techniques like simulations, game-based learning, and interactive forums in Odoo were pivotal in reducing comprehension time for complex cyber security concepts. Additionally, significant variations in pre- and post-learning test scores (p-value = 0.00038 and 0.00111) emphasize the importance of learning techniques that significantly enhance knowledge.

Blended learning, merging online and face-to-face methods, emerged as essential in the material design for Basic Cyber Knowledge,

considering the significant T-test results. This approach not only improved conceptual understanding but also the application skills necessary in real cybersecurity scenarios.

Testing and evaluation of the learning materials confirmed their effectiveness. Low p-values in the T-test underlined the need for comprehensive testing to identify material strengths and weaknesses, involving cadet feedback and knowledge test performance analysis.

This research offers a critical perspective on previous studies, highlighting the necessity for context-specific learning methods, especially in military cyber learning. The results provide new insights and relevant recommendations for developing materials and techniques in the Military Academy, focusing on Basic Cyber Knowledge.

Keywords: Cyber Learning, Military Academy, Odoo ERP Platform, Interactive Learning Methods, Practical Learning Techniques, Cyber Curriculum, SQL Injection, Educational Technology, Cyber Learning System, T-test, Learning Evaluation, Curriculum Integration, Cyber Skills Improvement, Military Education Innovation, PostgreSQL Database.

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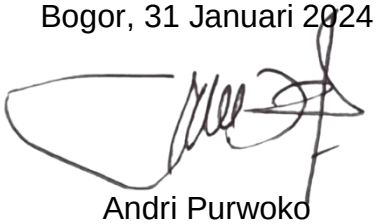

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