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UNIVERSITI  
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MARA

**UNIVERSITI TEKNOLOGI MARA  
CAWANGAN JOHOR KAMPUS PASIR GUDANG**

**FINAL YEAR PROJECT (EEE368)**

**ENERGY SAVING INTEGRATED MEETING ROOM  
SYSTEM WITH ENHANCED SECURITY FEATURES**

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## **ABSTRACT**

In modern office environments, the challenges of inadequate security measures and energy efficiency has risen as a significant concern particularly in meeting rooms. The optimization of energy usage is weakened as these spaces still utilize old technologies in handling the meeting spaces, leading to the escalation of the operational cost and environmental impact. This project addresses the urgency for an integrated system in meeting spaces that balances out energy consumption with prominent security features. This project bridges the gap by introducing an integrated system that would tackle both concerns of energy conservation and security concerns in office meeting rooms. This system utilizes an ultrasonic sensor which aids the system in automatically adjusting the lighting based on room occupancy. The system security is address through a multi-layered approach with combination of a 4x4 matrix keypad, RFID cards, and the Blynk app which controls an electromagnetic lock for the access to the meeting room. This system also provides immediate audio-visual feedback via the buzzer and Light Emitting Diode (LED) as indicators for the successful or unsuccessful access attempts of entry. This system has effectively repelled unauthorized entry attempts which proven the reliability of the system in various security scenarios. This intelligent approach showcases that the integrated system could lead to more secure, efficient, and a sustainable environment by ensuring less energy consumption occurred when the room is unoccupied and provides a user-friendly interface for users while enhancing the room's security.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 BACKGROUND OF STUDY

As concerns about sustainability and data breaches grip the corporate world, the inefficiencies and vulnerabilities of outdated meeting room tech become ever more glaring, demanding immediate attention and innovative solutions. Traditional office spaces, particularly meeting rooms, are often energy hogs, burdened by outdated technologies that guzzle power and inflate operational costs. This environmental impact is compounded by an unfounded fear among some: that energy efficiency comes at the expense of employee comfort and performance. Theories like "person-environment fit" debunk this misconception, highlighting the possibility of crafting energy-efficient spaces that are still productive and comfortable. But energy isn't the only concern. Security, especially in meeting rooms handling sensitive information, is equally critical. Inadequate traditional measures leave offices vulnerable to unauthorized access and data breaches.

Based on "Decoupling office energy efficiency from employees' well-being and performance: A systematic review," by Kozusznik, M. W., Maricutoiu, L. P., Peiró, J. M., Vîrgă, D. M., & Soriano, A. (2019), highlighted that traditional office spaces, including meeting rooms, often lack energy-efficient practices. This is partly due to older technologies that fail to optimize energy usage, resulting in increased operational costs and environmental concerns. The reluctance to adopt sustainable energy solutions can be attributed to misconceptions about the impact of energy efficiency on employee comfort and performance, despite theories like person-environment fit suggesting otherwise.