



**BUSITEMA
UNIVERSITY**
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**FACULTY OF ENGINEERING AND
TECHNOLOGY**

DEPARTMENT OF ELECTRICAL ENGINEERING

FINAL YEAR PROJECT REPORT

**TIMELY CLEARANCE OF EMERGENCY EXIT WAYS USING
SMART DOOR SYSTEM**

By

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REG NO: BU/UP/2023/3576

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**A FINAL YEAR PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF
ELECTRICAL ENGINEERING IN PARTIAL FULFILLMENT FOR THE AWARD
OF DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING OF
BUSITEMA UNIVERSITY**

DECLARATION

I, ONYANGO TOBIAS do declare that this project implementation is my original work and has never been published and/or submitted for any other degree award to any other university or institution of higher learning.

Signature.....

Date...15/06/2025

ACKNOWLEDGEMENT

I give thanks to the Almighty God for the provision of life and knowledge which has helped me up to the completion of this project, I as well greatly appreciate my Parents and Family at Large for their financial, social and spiritual support that even amidst all the challenges, they have stood by me to see me go through.

Appreciation also goes to my classmates for the support through the process and advice when needed, my main supervisor Mr. Patrick Mugwanya, co-supervisor Eng. Kilama George, the Department of Electrical Engineering for guidance and insight into concepts of research and project management as well as technical knowledge applicable in the design of the system.

ABSTRACT

Fire emergencies pose significant risks to human safety, with delayed evacuation due to obstructed or inaccessible exit ways contributing to high casualty rates. Traditional emergency exit systems, reliant on manual operations and basic alarms, often fail to address dynamic fire conditions, leading to inefficiencies in evacuation. This project proposes a smart door system integrated with fire flame and smoke sensors to enhance the timely clearance of emergency exit ways. The system employs real-time hazard detection to trigger automated door operations, ensuring rapid and unobstructed access to escape routes. By designing and testing a prototype in simulated fire scenarios, the project evaluates the system's effectiveness in reducing evacuation times and improving safety in high-occupancy buildings such as schools and commercial complexes. The significance of this work lies in its potential to save lives, align with modern fire safety standards, and contribute to the advancement of smart building technologies.

APPROVAL

This is to certify that the project titled "Timely clearance of emergency exit ways using smart door system" has been done under my supervision and is now ready for submission.

Main Supervisor

Mr. Patrick Mugwanya

Signature: 

Date: 

Co-supervisor

Eng. Kilama George

Signature: 

Date: 

Department of Electrical Engineering

DEDICATION

I dedicate this work to the Almighty God who gave me wisdom, strength, provision and above all life.

I dedicate this report to my dear guardian\ sponsor AWOR JOY OPONDO, my parents and the family members who helped and supported me financially, spiritually and materially during this project.

I dedicated this report to my friend with whom we worked and researched together with this project that is Mazira Jacqueline Kanzo, Ekochu Joseph and Dickson Adonga and all the entire diploma class members who always challenged me to get wider knowledge concerning the project.

Further dedication is to my main supervisors Mr. Patrick Mugwanya and the co supervisor Eng. Kilama George who guided me and molded me during project work at Campus.

Finally, with a lot of appreciation I dedicate this report to all the staff and department of electrical department Busitema University who gave us an opportunity to come up with project ideas and accepted me to take it on as my final year projects. May the Almighty God bless you abundantly.

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List of Acronyms

LCD	Liquid Crystal Display
ERD	Entity Relation Diagram
LED	Light Emitting Diode
IDE	Integrated Development Environment
GND	Ground
I2C	Inter Integrated Circuit
NFPA	National Fire Protection Association
PWM	Pulse Width Modulation
SDA	Serial Data
SCL	Serial Clock
VCC	Voltage Common Collector

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