

BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

Project title: AUTOMATIC ENERGY MANAGEMENT SYSTEM

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DECLARATION

I OMAR SHARIFF REG. No BU/UG/2011/828 declare that this project report is original and has not been published or submitted before to any University or higher institution of learning.

Signature..........
Date.....06/06/2018.....



APPROVAL

The final year project proposal under the title “Automatic home energy management system” has been done under my supervision and is now ready for examination.

Signature 

Date 06/06/2018

Ms. NAKIGANDA AGNES

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DEDICATION

To my mum...Mrs Jamila Abdallah and Shadia. You deserve this.

ACKNOWLEDGEMENT

I thank Allah for the life, health and family. I thank my family for the support they have always given me in my academics especially my mum Janila Abdallah.

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LIST OF ACRONYMS

IoE	Internet of Energy
IoT	Internet of Things
VR	Voice recognition
DC	Direct Current
AC	Alternating Current
PWM	Pulse Width Modulation
PC	Personal Computer
RFID	Radio Frequency Identifier
DTMF	Dual Tone Multi Frequency
V	Volts
IC	Integrated Circuit
LEDs	Light Emitting Diodes
LDR	Light Dependent Resistor
IDE	Integrated Development Environment
PCB	Printed Circuit Board
UEDCL	Uganda Electricity Distribution Company limited
UMEME	A private organization that supplies and distributes power to consumers

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ABSTRACT

Technology has greatly changed the way we live. Technology has become an integral in people's lives. The creation of many devices such as mobile phones and computers have caused many people to rely on technology to communicate with their friends, store information such as pictures, movies, documents, and music. The concept of home automation has developed rapidly since its inception where by different systems are aimed at making it easy for home owners and their people live comfortably with minimum energy wastage, security and minimal health risks.

Home automation involves automatic controlling of all electrical or electronic devices in homes or even remotely through wireless communication. Most of the existing systems require user input control such as through the use of buttons, levers, touch screens and mobile phone applications. Therefore, energy management entirely depends on the presence of a user to control for example the switching of lights and other commands to the system.

The main objective of this project is to design and develop an Automatic home energy management system to improve on the comfort and manage energy usage in homes. The developed system allows minimal user input through voice commands and a timing mechanism which can turn off appliances automatically in case the user forgets to switch off for example a TV and thus helps in minimizing energy wastage to reduce energy bills.

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CHAPTER ONE: INTRODUCTION

This chapter consists of the background, problem statement, objectives of the study, Justification, significance, the scope and limitations.

1.1 Background

In the world today, technology has greatly changed the way we live. Technology has become an integral in people's lives. The creation of many devices such as mobile phones and computers have caused many people to rely on technology to communicate with their friends, store information such as pictures, movies, documents, and music[1]. The advancements in technology have allowed better social interaction, ease of transportation, the ability to indulge in entertainment and media and have helped in the development in medicine and other aspects of life. Different disciplines in technology have paved way to applications of technology in the field of automation and energy management. The internet of energy concept which refers to the upgrading and automating of electricity infrastructures for energy producers, allows energy production to move forward more efficiently and cleanly with the least amount of waste[2]. The World Energy Council describes advances in energy software along with solar power as the biggest changes in the 21st century energy[3]. The implementation of Internet of Things (IoT) has helped achieve the concept of Internet of Energy (IoE).

The Internet of Things (IoT) is a robust network of devices, all embedded with electronics, software, and sensors that enable them to exchange and analyze data. The IoT has been transforming the way we live for nearly two decades, paving the way for responsive solutions, innovative products, efficient manufacturing, and ultimately, amazing new ways to do business[4]. This technology has enabled automation of buildings thus creating smart buildings. The first buildings ever constructed were primitive shelters made from stones, sticks, animal skins and other natural materials[5]. These early structures had the same purpose that is to provide a comfortable space for the people living inside. Modern buildings contain complex mechanical devices, sophisticated control systems and a suite of features to improve the safety, comfort and productivity of occupants[5].

Home automation systems make the operations of various home appliances more convenient and help in saving energy[1]. With the energy saving concept, home automation or building automation makes life very simple nowadays. It involves automatic controlling of all electrical or electronic devices in homes or even remotely through wireless communication[6]. Most of

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