BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

RADIO FREQUENCY BASED APPLIANCE CONTROL SYSTEM

SUBMITTED

BY

OKITOI NOAH

SUPERVISOR: Mr. ARINEITWE JOSHUA

A project Report submitted to the Department of Computer Engineering in Partial fulfillment of the requirements for the award of Bachelor's degree in Computer Engineering at Busitema

University

May 2017

DECLARATION

I, Okitoi Noah do hereby declare that this Project Report is original and has not been submitted for any other degree award to any other University before.

Signature……………………………………Date……………………………………………

Okitoi Noah

Bachelor of Computer Engineering

Busitema University.

APPROVAL

This Project Report has been submitted with the approval of the following supervisor(s).

Signature ....Date: ....

Mr. Arineitwe Joshua

Department of Computer Engineering

Faculty of Engineering

Busitema University.

ACKNOWLEDGEMENT

First of all, I thank the almighty God for the health, knowledge and provision through this whole project preparation period, may His name be glorified. Secondly, I thank my mum and brothers for the encouragement and financial help.

Special thanks to my supervisor; Mr. Arineitwe Joshua who guided me through the proposal, development and implementation stages, I appreciate.

I also wish to thank the entire Department of Computer Engineering for the guidance, knowledge and support through report making, project development and implementation stages.

Lastly but not least, the ICT Department of Busitema University, who provided the internet access resource, this greatly helped me in my research works. May the Almighty bless all of you abundantly.

DEDICATION

This report is dedicated to my wife Sarah Okitoi and my children Paula and Nathan Okitoi.

ABSTRACT

The design, implementation and testing of RF Based Home Appliance Control System is described in this report.

The idea behind the development of this system was conceived from the background that manual switching of appliances is inconveniencing and time consuming, given the many appliances in our homes. I thought about developing the RF Based Home Appliance Control System to enable the on/off control of these appliances anytime from any convenient location within a house, hence achieving convenience and saving time.

I then started on the process of developing the system with problem identification, problem modeling, requirements elicitation, researching, design and implementation, testing and documentation. Some steps were achieved through collection of related data, electronic and non-electronic books plus papers; this was done while keeping a full citation of their index. Consultations from technical and non-technical people were made; the technical people included the supervisors. Then my last process was the documentation stage that which I carried out on each and every stage of my progress in this project.

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LIST OF ACRONYMS

AT: Attention command

DVD: Digital Video Disc

IEEE: Institute of Electrical and Electronic Engineers

IR: Infrared

GSM: Global System for Mobile communication

LCD: Liquid Crystal Display

PC: Personal Computer

PDA: Personal Digital Assistant

PWM: Pulse Width Modulation

RF: Radio Frequency

SMS: Short Messaging Service

TV: Television

Wi-Fi: Wireless Fidelity

CHAPTER ONE
INTRODUCTION

1.1Background

There are several electrical appliances associated with the home and each has its own control switch which someone can use to turn on or off the appliance. Efficient control of these systems is a tedious task[1]. A home appliance is a device or instrument designed to perform a specific function, especially an electrical device, such as a refrigerator, for household use[2].

Home automation is the control of any or all electrical devices in our homes, whether we are there or away, being able to turn on/off devices and/or other tasks [3]. Traditionally, to switch on or off a device one has to go to a wall switch and this can be inconveniencing even for an able person. If all this manual work is replaced by a single remote control, much of human effort, time and electric costs would be saved[4].

Existing home automation systems use various technologies which include Bluetooth, infrared, intelligent voice control, GSM, Wi-Fi, ZigBee and RF. Even with all these technologies, home automation systems still face several challenges namely: consumer unfamiliarity with technology, complex user interfaces high manufacturing costs, high development costs, high installation costs, additional service and support costs, and lack of home automation standards[5].

Radio frequency (RF) remote control is where electrical appliances are being remotely controlled (turning on/off and/or other tasks) non-directionally, breaking barriers (not being affected by object in front of the receiving device). Using an RF remote to control simple appliances reduces human efforts without compromising on efficiency; saving time and electricity costs. Imagine a system in which the user operates various devices in the house all at the convenience of say his/her living room or bedroom. Such a system ensures that one does not have to struggle to reach a traditional switch located up the wall or far away. Radio frequency remote control lowers the human stress in adjusting or moving around, just to operate a simple appliance to the lowest degree possible but does not completely eliminate it[2].

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