BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

WEB BASED POWER UNIT USAGE MONITORING AND CONTROL SYSTEM FOR RESIDENTIAL HOUSE

BY

NYAFWONO DOROTHY

BU/UP/2014/325

ACKNOWLEGEMENT

I give glory to God and the Holy Spirit for the great help and guidance throughout this project. My Supervisor, Ms. Nakiganda Agnes who has continuously guided me throughout this project. She has been a parent to me and provided where necessary. May God bless you madam. Finally, great thanks to my father Mr. Odio Bonifance, mother Mrs. Jesca Odoi, my brothers, sisters and friends who have provided financially, materially, spiritually until the completion of this project, may God bless them abundantly.

DEDICATION

I dedicate this report to God, the Holy Spirit, my supervisor, Ms Nakiganda Agnes and my beloved parents Mr. Odoi Bonifance and Mrs. Jesca Odoi. Your contribution to my education has been wonderful, encouraging and promising a bright future in my life.

DECLARATION

I NYAFWONO DOROTHY BU/UP/2014/325 declare that this project report is original and has not been published or submitted before to any university or higher institution of learning.

Signature: …….

APPROVAL

This is to certify that the project under title" ***web based power unit usage monitoring and control system for residential house***" has been done under my supervision and is now ready for examination.

Signature ……. Date: ……

MS. NAKIGANDA AGNES
Department of Computer Engineering

LIST OF ACROYNMS

PCB	Printed Circuit Board
SaaS	Software as a Service
UI	User Interface
W	Watts
Wmin	Watt per minute

ABSTRACT

In Uganda, most of the power used in a residential house is consumed through sockets. Monitoring of power in these houses is currently done by use of YAKA meters which only views the total amount of power consumed. Other systems like the power monitoring plugs have been developed but most of them do only the monitoring and leave the rest to the user to find how they balance their power consumption. In some instances, dormant or unused devices are left powered on or in standby mode and consume power in this dormant state or standby mode The main objective of this project is to design and develop a web based power unit usage monitoring and control system for a residential house. The developed system is able to monitor real time power output from a socket whenever an appliance is plugged in and one can also control the socket by either switching it on or switching it off anytime anywhere on internet connection.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

The present day technology is all about the automation and wireless control of all the equipment used in industries, factories and households. Any equipment that can be controlled wirelessly is more easily maintained and it responds very fast compared to the manual operation of the equipment. It increases safety as well as speed of operation in times of failure or damage[1]. The electrical distribution system plays a critical role in the built environment as it is an enabling product, an intangible necessity used to power our systems[2].

Households are also the fastest growth market for electrical connections, growing at 13% per annum[3]. Household energy demand thus presents as an important area for investigation, given the total number of households in 2014 stood at 7,353,427[4], suggesting a tremendous potential for growth in energy demand. Understanding demand and consumption of energy, presents an opportunity to better address the needs of users, but requires information about current energy use patterns.

As energy costs are increasing, more and more consumers are becoming actively interested in reducing their energy consumption. The magnitude of the savings depends on the type of feedback or information offered, cost of power, interface type and format, and other social and economic factors. The use of real-time feedback presents an opportunity to decrease energy consumption by 10%-20%[5, 6]. In general, when presented with the appropriate information on energy usage, average home owners will change their consumption behavior to decrease their monthly electrical consumption and electricity bill.

Existing systems, several real-time monitors (RTM) created to provide real-time information to prompt consumers curb their electricity use are available in the market. However, their effectiveness is limited due to their interface and mixed information. It is also limited due to the user ‘s knowledge of what action to take to curb the current wasted energy. Hence, current RTMs are not designed to take into account consumer behaviors in response to residential energy consumption and conservation[7].

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