SMART IOT POWER SOCKET FOR HOME AUTOMATION AND ELECTRICITY WASTE PREVENTION

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SMART IOT POWER SOCKET FOR HOME AUTOMATION AND ELECTRICITY WASTE PREVENTION

This report is submitted in accordance with the requirement of Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours.

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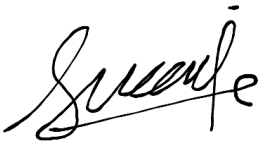
I hereby declare this report titled SMART IOT POWER SOCKET FOR HOME AUTOMATION AND ELECTRICITY WASTE PREVENTION is the result of my own research except as cited in the references.

Signature: 

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours. The supervisory members are as follows:

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ABSTRAK

Dalam era globalisasi ini, dunia didorong oleh teknologi maklumat dan komunikasi. Hampir setiap masa manusia akan menggunakan teknologi maklumat dengan mengawal segalanya di hujung jari mereka. Elektrik adalah bahagian penting dalam kehidupan. Setiap hari kita menggunakan peralatan elektrik. Di dunia yang serba pantas ini, kita semakin bergantung pada tenaga untuk menjalankan aktiviti seharian. Walau bagaimanapun, ramai di antara kita masih membazir tenaga elektrik tanpa menyedarinya terutama orang-orang yang sering terlupa untuk menutup suis yang tidak digunakan. Ia akan mempengaruhi keseimbangan persekitaran. Pada masa ini, suis dinding konvensional yang terletak di bahagian rumah yang berbeza menyukarkan pengguna untuk menghampirinya untuk membuka dan menutup suis. Lebih sukar bagi orang tua atau orang cacat fizikal untuk melakukannya. Oleh itu, tujuan projek ini adalah untuk membangunkan Smart IoT Power Socket untuk Automasi Rumah dan Pencegahan Sisa Elektrik. Objektif projek ini adalah untuk mengembangkan soket kuasa IoT pintar yang dapat digunakan untuk mengawal dan memantau peralihan peralatan rumah tangga melalui telefon pintar yang disambungkan dengan Wi-Fi. Objektif kedua adalah untuk menganalisis keberkesanan sistem prototaip yang dikembangkan dalam mengurangkan pembaziran tenaga elektrik. Projek ini menggunakan sistem IoT yang disambungkan ke peranti dan perkakas kami untuk membolehkan kita memantau semua suis di rumah kita melalui laman sesawang. Hasilnya, pengguna boleh mengawal ke semua suis hanya di hujung jari. Kesimpulannya, projek ini mempunyai elemen rumah pintar di mana ia bermanfaat untuk pengguna seperti dapat menjimatkan masa pengguna, menjimatkan tenaga pengguna, mudah digunakan dan lain-lain.

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ABSTRACT

In this era of globalization, the world is fuelled by information and communication technologies. Almost every time, people will use information technology by controlling everything at their fingertips. Electricity is an essential part of life. Every day we use electrical appliances. In this fast-paced world, we are increasingly relying on energy to carry out our daily activities. However, many of us are still wasting electricity energy without realizing it especially the people who often forget to close the unused switched. It will affect the balance of the environment. Presently, conventional wall switches located in different parts of the house and make difficult for them to go near switches to turn OFF and ON the switch. Even more it becomes more difficult for the elderly and physically disabled people to do so. Therefore, the purpose of the project is to develop a Smart IoT Power Socket for Home Automation and Electricity Waste Prevention. The objective of this project is to develop a Smart IoT Power Socket that can be used to control and monitor the home appliances switching via smartphones. Second objectives are to analyze the effectiveness of the developed prototype system in reducing electrical energy wastage. This project used an IoT system which is connected to our devices and appliances to enable user to monitor all switches in our home using website on smartphone or computer. As a results, users can control theirs switches just at their fingertips. In conclusion, this project has an elements of smart home where its beneficial for users such as can save users time, save users energy, easy to use and others.

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DEDICATION

To my beloved parents, thank you so much for all the supports given. This also be dedicated to my fellow friends and supervisor of Universiti Teknikal Malaysia Melaka who involved directly or indirectly in finishing this project report and assisting me at this final year project to complete this project

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

		PAGE
ABSTRAK		**vi**
DEDICATION		**viii**
ACKNOWLEDGEMENT		**ix**
TABLE OF CONTENTS		**x**
LIST OF TABLES		**xiv**
LIST OF FIGURES		**xv**
LIST OF APPENDICES		**xix**
LIST OF SYMBOLS		**xx**
LIST OF ABBREVIATIONS		**xxi**
CHAPTER 1	**INTRODUCTION**	**1**
1.1	Project Background	1
1.2	Problem Statement	3
1.3	Research Objectives	3
1.4	Scope of Project	4
CHAPTER 2	**LITERATURE REVIEW**	**5**
2.1	Introduction	5
2.2	Development of an Energy-Efficient Smart Socket Based on STM32F103	5

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.3 Home Energy Control System Using Wireless Smart Socket and IoT 8

2.4 New design of Socket Module for Smart Home Application 10

2.5 Electricity Aware Open Source Smart Socket for the Internet of Energy 12

2.6 Smart Power Outlet Switching Device Using ESP8266 14

2.7 The comparison between all the literature review 17

2.8 Summary 20

CHAPTER 3 METHODOLOGY 21

3.1 Introduction 21

3.2 Research Methodology 21

3.3 System Design 23

3.3.1 Hardware Selection 24

3.3.1.1 ESP32 for Smart IOT Power Socket 24

3.3.1.2 4 Channel Way 5V Relay Module 25

3.3.2 Software Selection 26

3.3.2.1 Arduino Programming Language: C/C++(Arduino IDE) 26

3.3.2.2 HTML Software 26

3.4 System Implementation 27

3.4.1 Socket modification process 27

3.4.2 Hardware connection to circuit 29

3.4.3 Software structure implementation 33

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.5 System Integration 34

3.5.1 The Project Design 35

3.6 System Operation 37

3.6.1 Block Diagram 37

3.7 Flowchart of the system 39

3.8 Flowchart connection from NodeMCU ESP32 to website 40

3.9 Summary 40

CHAPTER 4 RESULT AND DISCUSSION 41

4.1 Introduction 41

4.2 Software Results 41

4.2.1 Web Page Design 41

4.2.2 Demonstration project on software 43

4.3 Hardware Results 44

4.3.1 Demonstration of project using manual and smartphone method 44

4.4 Cost of the whole project 49

4.5 Analysis of project 50

4.6 Discussion 54

4.7 Summary 55

CHAPTER 5 CONCLUSION AND FUTURE WORK 56

5.1 Introduction 56

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

5.2 Summary 56

5.3 Future Enhancements 57

5.4 Project Potential of Commercialization 58

REFERENCES **60**

APPENDICES **62**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF TABLES

TABLE	TITLE	PAGE
Table 2. 1:	Comparison the literature review	17
Table 3. 1:	The output when Relay are connected to ESP 32	30
Table 4. 1:	Demonstration switches on software	43
Table 4. 2:	Lamp are connected to Socket 1	45
Table 4. 3:	Water Heater are connected to Socket 2	46
Table 4. 4:	Iron are connected to Socket 3	47
Table 4. 5:	Fan are connected to Socket 4	48
Table 4. 6:	Total Cost of project	49

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

FIGURES	TITLE	PAGE
Figure 2. 1:	Block diagram of the smart power saver socket	7
Figure 2. 2:	Block diagram of home energy control system.	9
Figure 2. 3:	The connection of PZEM-004T and ESP32 unit	11
Figure 2. 4:	The schematic design of smart socket	11
Figure 2. 5:	The Subsystem diagram of Smart Socket for the Internet of Energy	12
Figure 2. 6:	Block Diagram of Open Source Smart Socket	13
Figure 2. 7:	Nurun based transformed prototyping	15
Figure 2. 8:	Block diagram of the Smart Power Outlet Switching Device	16
Figure 3. 1:	The stages in waterfall model	22
Figure 3. 2:	Circuit of the whole project	23
Figure 3. 3:	NodeMCU ESP32	24
Figure 3. 4:	4 Channel Relay Module	25
Figure 3. 5:	Logo of Arduino IDE	26
Figure 3. 6:	Logo HTML	26
Figure 3. 7:	Process of drilling a hole	27
Figure 3. 8:	Soldering Process	28
Figure 3. 9:	Wire insert into the hole	28

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 3. 10:	Container that has been drilled	28
Figure 3. 11:	Connection ESP 32 to Relay Module	29
Figure 3. 12:	Connection ESP 32 to Relay Module on project	29
Figure 3. 13:	GPIO32 connected to IN 1 Relay	30
Figure 3. 14:	GPIO33 connected to IN2 Relay	30
Figure 3. 15:	GPIO 27 connected to IN 3 Relay	31
Figure 3. 16:	GPIO 26 connected to IN4 Relay	31
Figure 3. 17:	Connection Relay Module to Sockets	31
Figure 3. 18:	Connection Relay Module to Sockets on project	32
Figure 3. 19:	The Web page of project	33
Figure 3. 20:	The connection of the whole circuit	34
Figure 3. 21:	Drawing of the project	35
Figure 3. 22:	Smart IoT Power Socket from various angles	36
Figure 3. 23:	PVC Electrical Box Smart Socket	36
Figure 3. 24:	Block Diagram of the overall project	37
Figure 3. 25:	Flowchart of the overall project	39
Figure 3. 26:	Flowchart of the system	40
Figure 4. 1:	The display of Web Page	41
Figure 4. 2:	The IP configuration will display when connected to Wi-Fi	42
Figure 4. 3:	Socket 1 is turn ON	43

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4. 4:	Socket 2 is turn ON	43
Figure 4. 5:	Socket 3 is turn ON	43
Figure 4. 6:	Socket 4 is turn ON	43
Figure 4. 7:	Socket 1 is turn ON using manual	45
Figure 4. 8:	Socket 1 is turn OFF using manual	45
Figure 4. 9:	Socket 1 is turn ON using smartphone	45
Figure 4. 10:	Socket 1 is turn OFF using smartphone	45
Figure 4. 14:	Socket 3 is turn ON using manual	46
Figure 4. 15:	Socket 3 is turn OFF using manual	46
Figure 4. 16:	Socket 3 is turn ON using smartphone	46
Figure 4. 17:	Socket 3 is turn OFF using smartphone	46
Figure 4. 14:	Socket 3 is turn ON using manual	47
Figure 4. 15:	Socket 3 is turn OFF using manual	47
Figure 4. 16:	Socket 3 is turn ON using smartphone	47
Figure 4. 17:	Socket 3 is turn OFF using smartphon	47
Figure 4. 18:	Socket 4 is turn ON using manual	48
Figure 4. 19:	Socket 4 is turn OFF using manual	48
Figure 4. 20:	Socket 4 is turn ON using smartphone	48
Figure 4. 21:	Socket 4 is turn OFF using smartphone	48
Figure 4. 22:	The percentages of people often forget to switch off unused switch	50
Figure 4. 23:	The percentages of appropriate distance	51

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Figure 4. 24: The percentages of flexibility projects 52

Figure 4. 25: The graph of total rate for Smart IoT Power Socket 53

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
APPENDIX 1:	Gantt Chart	62
APPENDIX 2:	Coding of whole project	64
APPENDIX 3:	Survey in Google Form	69
APPENDIX 4:	Specification ESP 32	72

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF SYMBOLS

D, d	-	Diameter
Ohm	-	Si unit for electrical
V	-	SI unit for electromotive force
DC	-	Direct Current
AC	-	Alternate Current
I	-	SI unit for Current
MHz	-	Megahertz
GHz	-	Gigahertz
r	-	Radius
Kbps	-	Kilobits Per Second
x	-	Displacement
z	-	Height
q	-	Angle

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LIST OF ABBREVIATIONS

IOT	Internet of Things
HTML	Hypertext Markup Language
LED	Light Emitting Diode
IP	Internet Protocol
LCD	Liquid Crystal Display
USB	Universal Serial Bus
Wi-Fi	Wireless Fidelity
WLAN	Wireless Local Area Network
IDE	Integrated Development Environment
GPIO	General Purpose Input/Output
PVC	Polyvinyl Chloride
MCU	Microcontroller Unit
GND	Ground
ESP	Espressif

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CHAPTER 1

INTRODUCTION

1.1 Project Background

Nowadays, the world is fueled by information and communication technologies. Advances in the field of information technology in the country have stimulated new lifestyles and changed consumer tastes. Information technology has become so prevalent today. Almost every time, people will use information technology by controlling everything at their fingertips. However, (Rajpoot & Khandelwal, 2018) said energy conservation had been one of our everyday lives' legal problems to keep away from people's belongings of the green planet. In fact, energy management is an efficient way of saving energy in our home, preventing users from consuming too much electricity. While various commercial energy-efficient devices are useful in saving electricity for individual appliances, an overall outcome to efficiently minimize appliance consumption in a house is hard to find.

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Therefore, Smart IoT (Internet of Things) Power Socket for Home Automation for Electricity Waste Prevention is designed with smart IoT wireless sockets to improve home energy usage and manage and track all household equipment and devices through a smartphone. This product can make it easy for users to turn off the power of any smart socket connected to IoT when the electric devices are not used. Besides, this product technology refers to any suite of appliances, devices, or systems connected into a common network that can be independently and remotely controlled. So, all the devices

and home appliances connected to Smart IoT Power Socket are working together in one system. As we know, Smart Socket plays an essential role in home applications and safety.

In general, (Zennaro, n.d.) proposed the Internet of Things (IoT) is simply a network of interconnected devices embedded into sensors, applications, networking, enabling critical data collection and sharing. However, IoT tools may track and manage mechanical, electrical and electronic systems used in the home automation and building automation systems of different types of buildings such as public and private, commercial, institutional or residential.

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