Final Report Project 2

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WIFI SMART PLUG WITH VOICE ASSISTANT

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JABATAN KEJURUTERAAN ELEKTRIK

2022

WIFI SMART PLUG WITH VOICE

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

JUNE 2022

CONFIRMATION OF THE PROJECT

The project report titled "Wifi Smart Plug with Voice Assistant" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the project writing as stipulated.

Checked by:

Supervisor's Name:

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Project Coordinator Name:

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"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature : 

Name: MUHAMMAD NAZRUL NADZREEN BIN ROSLAN

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Date: 17/6/2022

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : WIFI SMART PLUG WITH VOICE ASSISTANT

SESSION : SESI 2 2021/2022

1. I, Muhammad Nazrul Nadzreen Bin Roslan is a final year student of Diploma in Electrical Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah, which is located at Persiaran Usahawan, 40150 Shah Alam, Selangor.

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the Diploma in Electrical Engineering to me.

Made and in truth that is recognized by;

a) MUHAMMAD NAZRUL NADZREEN BIN ROSLAN .....
(Identification card No: 08DEP19F2007) MUHAMMAD NAZRUL NADZREEN

In front of me,PUAN NUR HADIANA BINTI NASRUDDIN .....

As a project supervisor, on the date: PUAN NUR HADIANA BINTI NASRUDDIN

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I am very happy to be given the opportunity to implement this project. I would like to thank all the PSA Polytechnic lecturers who were involved in helping and providing support. In addition, I am also grateful to the Project Supervisor, Puan Nur Hadiana Binti Nasruddin who provided various knowledge and ideas in producing a quality project.

I would also like to thank my parents for their cooperation and encouragement who have always been there to help me in completing this Project. My thanks and appreciation are also extended to my friends who are also willing to help me with their abilities in developing this Project.

ABSTRACT

A smart home refers to a convenient home setup where appliances and devices can be automatically controlled remotely from anywhere with an internet connection using a mobile or other networked device. Devices in a smart home are interconnected through the internet, allowing the user to control functions such as security access to the home, temperature, lighting, and others remotely. Many product have been produce to make our home become smart home and one of the product is Smart Plug. Smart plug is a power plug which can be fitted between power cords and sockets to function as a remote controlled power switch. As such, smart plugs can be used to make "dumb" electrical equipment become "smart". In this paper, I propose the system of smart plug that connected with wifi and also have voice assistant to simplify the affairs of users as well as save their time, energy and money. The main component in this project is ESP8266. This esp8266 will be program by using Arduino IDE and it will connected with wifi network user. This smart plug is successful in controlling the electric appliances by using our smartphones and also can be control using our voice with voice assistant such as Google Assistant.

ABSTRACT

Rumah pintar merujuk kepada persediaan rumah yang selesa di mana peralatan dan peranti boleh dikawal secara automatik dari jauh dari mana-mana sahaja dengan sambungan Internet menggunakan peranti mudah alih atau rangkaian lain. Peranti di rumah pintar disambungkan melalui Internet, membolehkan pengguna untuk mengawal fungsi seperti akses keselamatan ke rumah, suhu, pencahayaan dan lain-lain dari jauh. Banyak produk telah dihasilkan untuk menjadikan rumah kita menjadi rumah pintar dan salah satu produknya ialah Palam Pintar. Palam pintar ialah palam kuasa yang boleh dipasang di antara kord kuasa dan soket untuk berfungsi sebagai suis kuasa kawalan jauh. Oleh itu, palam pintar boleh digunakan untuk menjadikan peralatan elektrik "bodoh" menjadi "pintar". Dalam kertas kerja ini, saya mencadangkan sistem palam pintar yang disambungkan dengan wifi dan juga mempunyai pembantu suara untuk memudahkan urusan pengguna serta menjimatkan masa, tenaga dan wang mereka. Komponen utama dalam projek ini ialah ESP8266. Esp8266 ini akan diprogramkan dengan menggunakan Arduino IDE dan ia akan disambungkan dengan rangkaian wifi pengguna. Palam pintar ini berjaya mengawal peralatan elektrik dengan menggunakan telefon pintar dan juga boleh dikawal menggunakan suara dengan pembantu suara seperti Google Assistant.

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DIY - Do It Yourself

IoT - Internet of Things

LED - Light Emitting Diode

AC - Alternating Current

DC - Direct Current

IDE - Integrated Development Environment

OKU - Orang Kurang Upaya

CHAPTER 1

1 INTRODUCTION

1.1 Introduction

The concept of a "smart home" is no longer a foreign concept to most home owners. A smart home is defined as a residence that uses Internet connected devices and appliances to enable the residents to live in a comfortable environment, improve their quality of life, and remotely monitor, control, and manage their home appliances and devices. The number of smart homes is expected to steadily rise and become trend now day. Not all connected devices are smart. Smart devices that are really smart incorporate artificial intelligence, machine learning, deep learning from their environment, are easy to use, and can be trusted.

One of the smart electrical devices that was a part of a smart home concept is smart plug. It makes it easy to turn electrical devices on and off, control home electronic devices from anywhere and allows user to monitor home energy usage from a smartphone, tablet computer or voice using Amazon Alexa, Google Home, Apple Siri or other virtual digital assistants. I argue that it is possible to convert an ordinary home into a somewhat smart home by using smart plugs to control the usage of electrical appliances that are plugged into them and thus can save the energy of electricity.

But most of people still using a standard or normal plug which is can be see and buy at shopping mall or supermarket and DIY store. Sometimes people are careless and easily forget about simple and small things. One of the common simple or basic things people always do is they forgot the turn off their plug before they leave the home. Somehow this simple thing can be the cause of things that will make things difficult and can even make things become worse. So basically this project will solving the people problem and issues.

1.2 Background Research

A smart plug is a power plug which can be fitted between power cords and sockets to function as a remote controlled power switch. As such, smart plugs can be used to make "dumb" electrical equipment become "smart" and there by enable such devices for home automation or building automation purposes.

Smart plugs can for example be controlled via a mobile application, a smart home hub or a virtual assistant. Examples of protocols used for communication with smart plugs include Wi-Fi, Bluetooth, ZigBee and Z-Wave. Many smart plugs have a built-in ammeter so that electric energy consumption (measured in kilowatt-hours) of the connected equipment can be monitored. Smart plugs often have a slim profile so as not to hinder access to neighbouring sockets in a wall outlet or power strip.

1.3 Problem Statement

Research has shown in typical urban households in Malaysia, the highest electricity consumption goes to the air conditioner, followed by the fridge and water heater. Many of them do not realise that the temperature need not be set too cold. The same goes for offices. It is a waste of electricity by setting the temperature so low. Every degree we raise we are saving 10% of electricity consumption. If we raise five degrees, then we save at least 50% of the consumption.

(i) People forgot to turn off the plug switch before leaving the house.

(ii) The cost of expenses becomes higher as electricity bills increase.

(iii) Risk of short circuit due to overload.

1.4 Research Objectives

The main objective of this research is to measure the connectivity between smart plug with smartphones which is related to IoT system that can be implemented on common or traditional plugs, so that the plug can be more futureristic and smart. However, to achieve the main objective, the following objectives need to be achieve first.

a) To simplify the affairs of users as well as save their time, energy and money.
b) To prevent the occurrence of unwanted things such as short circuits due to overload.
c) To reduce electricity wastage.

1.5 Scope of Research

In order to achieve the objective of the project, several scopes have been outlined. The main scope of this project is about to solve the problems people often face when they leaving the house. Other scopes of this project are:

1.This smart plug needs internet connectivity which is Wi-fi.

2.Suitable for android phones only.

3.Only one device connected for one smart plug.

4.Worldwide people can buy this Wi-fi Smart Plug.

5.Suitable for career people which is always busy and don't have much time.

6.Recommended for people with disabilities to buy and use this Wi-fi smart plug.

1.6 Project Significance

Now days, smart power channels are integrated with the function of sending signals via Wi-fi and telephone waves. With an internet connection, or a telephone wave, you can easily control the plug anywhere and anytime. But you must always pay attention to putting the sockets in places with good Wi-fi, so that they receive control commands without interruption. Devices that you can control over the phone such as electric fans, air conditioners, TVs, smart speakers, radios and etc. This will be give advantages to people who also busy and don't have much time because of their own career. This project also very important to people that have illness especially to the elderly and disabled people(OKU).

Many consumers also often mistakenly think that, without using an electrical appliance, it will not use electricity, but in fact when not in use, the appliance is still in standby mode. That's why your electricity bill is always high. With a smart plug connected to a smartphone app, users can control electrical devices via the phone, turning off electrical devices in a timely manner when not in use. This will save your energy and time as well save your money.

1.7 Chapter Summary

In this first chapter, I have described about the background research of the original idea for the beginning of this project. Then, I have identified the problems that are happening nowadays. In addition, I have demonstrated the objectives in this project and I have removed the scope the study I obtained from the objective study. Finally, I came up with an important project.