

## Automated Room System for Disabled People

**Muhammad Ammar Haziq<sup>1</sup>, Nur Shazwani<sup>1</sup>, Mohd Nurul Al-Hafiz Sha'abani<sup>1,2,\*</sup>, Norezmi Md Jamal<sup>3</sup>**

<sup>1</sup>Department of Electrical Engineering, Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub, 84600, Pagoh, Johor, MALAYSIA

<sup>2</sup>Microcontroller Technology for IoT Focus Group (MTIT), Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub, 84600, Pagoh, Johor, MALAYSIA.

<sup>3</sup>Department of Electrical Engineering Technology, Faculty of Technology, Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub, 84600, Pagoh, Johor, MALAYSIA.

\*Corresponding Author Designation

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**Abstract** : Room automation for disabled people is a system to control home appliances through a smart phone. This project is created to help the disabled who cannot do their own work and such devices can be a great help for these people. The aim of the project is to develop a system which gives convenience and quality of life for the disabled person. The project utilizes Wi-Fi and internet connectivity to control lamp and fans remotely. After the hardware setup is finalized, a simple graphical user interface is created using a Blynk application. When the virtual button on Blynk apps is pressed every component will start operating. For instance, when the Lamp 1 virtual button is pressed it will turn on Lamp 1. Then, when the Lamp 2 virtual button is pressed it will turn on Lamp 2. Finally, when the Fan virtual button is pressed it will turn on the fan. Additionally, when the Buzzer virtual button is pressed it will turn on the buzzer. A room automation system can be very beneficial for a half-paralyzed person. With the help of this project, they can control various aspects of their home such as lighting, fan, and emergency button without having to physically move around. This can greatly improve their quality of life and increase their level of independence.

**Keywords:** Wi-Fi Module Node MCU ESP 8266, Blynk Apps, Wi-Fi Connection

## 1. Introduction

Home automation uses one or more computerized remotes to control basic home appliances remotely and sometimes automatically. Automation and wireless technology have become key technology in the twenty-first century. The high performance and availability of smartphones increasing the implementation of internet of things technology. Home automation not only refers to reducing human efforts but also energy efficiency and time-saving. The system also helps the disabled to controlling home appliances using their mobile phones. The system is secure, user friendly, reliable, flexible and affordable [1]. Automating the Home helps in saving electricity, reduces manual labor, increases reliability and efficiency. Home automation for the OKU can increase the quality of life for those who might require caregivers or institutional care. The benefit of automation is also protection from harmful shock. The growing numbers of the OKU population and increasing life expectancy have brought enormous challenges to many aspects of human life, especially in health and healthcare.

Home management is becoming smarter and more developed today with the aid of automation devices. Home electrical appliances use remote control switches instead of conventional switches. In today's world, most people have access to smartphones and their use has become very popular and important in our lives. With the vast improvement of internet coverage, the Internet of Things (IoT) application allows users to control home appliances remotely with the aid of controllers and communication devices [2].

This project was created because it can be very helpful for OKU who cannot do their own work and such devices can be a great help for these people. Therefore, the existence of a home automation system can minimize every problem and risk that exists. A simple example of use of automation in home can be seen in controlling home electronics such as lamps and fans. Therefore, to make a low cost automation system in which the smart phones can be used to help automate the entire home is essential [3]. In this system the user will have remote access and control over all the subsystems present in the house.

The aim of the project is to develop an Automated Room for OKU to have a better and quality life. To archive the aim, several objectives are to be accomplished which is to develop a system that will not burden the OKU person. Beside that is to develop the home automation system for a better home environment. Last but not lease to develop an application for smartphones as a remote control.

The project scope for this project is helping half-paralyzed people to live the fullest in their daily life, building a high-quality automated room system for OKU, Wifi module node mcu ESP-8266 as the main board, smartphone with Blynk application and a physical and virtual emergency button for half-paralyzed people. With this scope many OKUs people can be help throughout their life.

## 2. Materials and Methods

After confirmation of the project title, preliminary research is done to analyze the existing home automation systems to find the problems before recommending a more practical approach. Further research is then made to find the most suitable hardware and software in executing the project. The plan for the system's design is then laid out and materials are purchased. The Arduino programming language must be familiarized. The next step involves getting the system to work wirelessly utilizing the WiFi module and wireless control through connection of the internet to control lamp and fan appliances. After the hardware setup is finalized, a simple graphical user interface is created using an android application. Once the system is found to be stable, a more practical setup will be built having the microcontroller to control the actual electronic appliances.

## 2.1 Materials

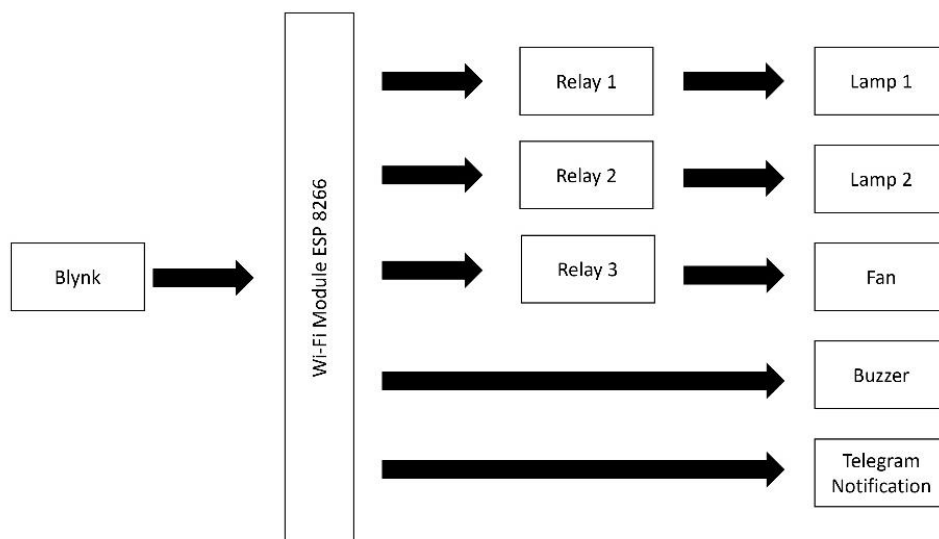
This room automation systems consists of hardware and software. The hardware parts control the operation of lights and fan when triggered by virtual button on software part. **Table 1** shows the hardware components and softwares utilized for this project. For hardware part, the components are nodemcu ESP8266, relay, light bulb, fan and buzzer. While, for software part, the Arduino IDE and Blynk application are used. Blynk App is an application used as a medium of data transmission including control and monitoring [5].

**Table 1: Hardware and software components of the project**

Component	Function
Nodemcu ESP 8266	A Wifi module to control all house applicants
Relay	Driving loads like 10V from digital output of the Arduino board
Light Bulbs	Device to be controlled
Fans	Device to be controlled
Buzzer	To act as an emergency alarm
Arduino IDE software	Compiler
Blynk App	The IoT dashboard application

## 2.2 Methods

In this project, the nodemcu ESP8266 for the development of a Automated Room System project is remotely controlled by a smartphone application. The nodemcu ESP8266 is a low cost integrated Wi-Fi module which widely used on various IoT applications [4]. **Figure 1** shows the block diagram of the proposed systems. The Wi-Fi module ESP8266 is connected to two lamps and one fan throught relays. The system used two notifications method through a buzzer and Telegram. The lamps and fan are controlled on Blynk via smartphone.

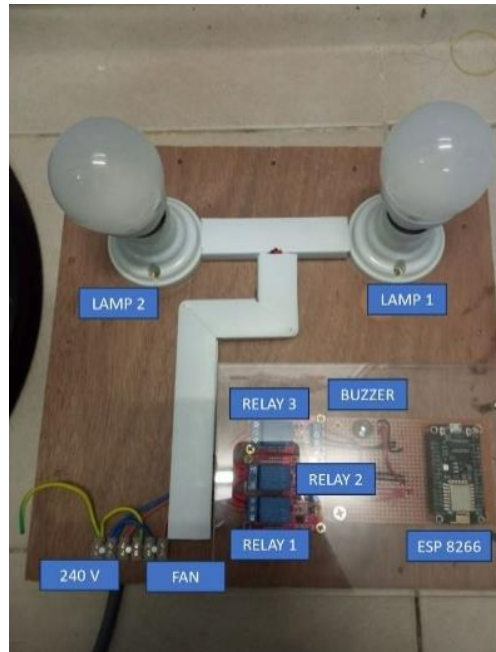


**Figure 1: System block diagram**

### 3. Results and Discussion

#### 3.1 Results

**Figure 2** shows the technical view of the automated room system for OKU project. When the virtual button on Blynk is pressed, the corresponding component will start operating. For example, when the virtual button linked to Lamp 1 is pressed, the Lamp 1 will turn on or off. The same operation are occurred for Lamp 2, fan and buzzer.



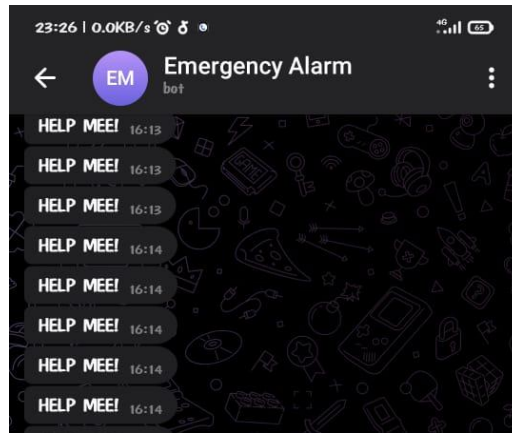
**Figure 2: The developed systems**

After the successful connection to the server, the Blynk dashboard would work as a virtual remote for the house applicants. **Figure 3** shows the dashboard page which will allow user to monitor and control the system. The dashboard act as a remote control for the user to control electrical appliances such as lamps, fan and emergency switch. From the dashboard user also could send emergency alert notifications to other users smartphone through Telegram.



**Figure 3: The Blynk dashboard on a smartphone**

All necessary emergency notifications are sent via Telegram. The sended data can be received anytime and anywhere when the emergency button in the Blynk dashboard is pressed. **Figure 4** shows the emergency notification sent by the user to alert other user, specifically the guider to the disabled person through Telegram. This alerts them to help the disabled person immediately.



**Figure 4: Emergency notification**

**Table 2** shows the result from the project. The result is being analysed when the virtual button on Blynk application is pressed.

**Table 2: Blynk virtual buttons operation**

No.	Item	Blynk virtual button condition	Home applicant condition
1	Lamp1	ON	Light Up
		OFF	Turn Off
2	Lamp 2	ON	Light Up
		OFF	Turn Off
3	Fan	ON	Turn On
		OFF	Trun Off
4	Buzzer	ON	Buzzer activate
		OFF	Buzzer deactivate
5	Emergency	Button pressed	Send "Help Me" message notification to Telegram
		Button released	Does not send message

### 3.3 Discussions

Home automation systems can help OKU with a variety of tasks, such as controlling lamps, fans and emergency buttons. These systems can help OKU in any living space, whether it's a house, apartment, or assisted living facility. It can help OKU with daily tasks at any time, making it easier for them to manage their home without needing additional assistance. Home automation systems can help OKU with daily tasks by providing them with an easier and more accessible way to control appliances and devices in their home. This can help increase their independence and improve their quality of life. This project can be programmed to help OKU with daily tasks, such as turning on/off lamps, opening/closing fans, and needing help in an emergency. There are many home automation systems available that can help OKU with daily tasks, such as Amazon Alexa, Google Home, and Apple HomeKit. It's important to choose a system that is compatible with the OKU's specific needs and abilities.

There are many room automation systems available that can help minimize problems and risks, such as smart lighting, temperature control, and security systems. However, it's important to choose a system that is compatible with the specific needs and abilities of the user to ensure that it is effective and safe. Room automation systems can help minimize problems and risks at any time, whether it's during the day or at night. These systems can provide assistance with daily tasks, such as turning off lights and locking doors, which can help reduce the risk of accidents and break-ins. Room automation systems can be installed in any living space, such as a house, apartment, or assisted living facility. These systems can help minimize problems and risks in any room of the home, including the bedroom, living room, kitchen, and bathroom. There are many room automation systems available that can help minimize problems and risks, such as smart lighting, temperature control, and security systems. However, it's important to choose a system that is compatible with the specific needs and abilities of the user to ensure that it is effective and safe. Some popular options include Amazon Alexa, Google Home, and Apple HomeKit. Room automation systems can help minimize problems and risks by providing assistance with daily tasks, such as turning off lights and locking doors, which can help reduce the risk of accidents and break-ins. These systems can also provide alerts and notifications in case of emergencies, such as fires or floods. Additionally, some systems can monitor the user's health and well-being, such as detecting falls or changes in heart rate, and alerting caregivers or emergency services if necessary.

#### **4. Conclusion**

A room automation system can be very beneficial for someone who is half paralyzed. With the help of remote controls, they can control various aspects of their home such as lighting, fan, and emergency button without having to physically move around. This can greatly improve their quality of life and increase their independence. In addition to the benefits of increased independence and ease of use, a room automation system can also provide safety and security for someone who is half paralyzed. For example, they can push their emergency button in the Blynk application and receive notifications on their relatives phone if there is any emergency. They can also use the system to turn off and turn on lamps and fan.

However, it's important to keep in mind that a room automation system is not a one-size-fits-all solution. The system should be customized to the individual's specific needs and abilities. For example, if the person has difficulty speaking or hearing, the system should be designed to accommodate those challenges. It's also important to ensure that the system is reliable and easy to use, as any technical difficulties or complications could cause frustration or even danger for the user. Overall, a room automation system can greatly improve the quality of life for someone who is half paralyzed, providing increased independence, safety, and peace of mind.

#### **4.1 Acknowledgement**

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