Smart Home Automation and Security System using IoT

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This project was entitled "Smart Home Automation and Security System using IoT" submitted by Md. Nobi Hossain, Md. Rajoan Parvej and Robin Mia from the Daffodil International University's Department of Informatics and Engineering are pleased that they partially fulfill the B.Sc degree requirements. In Computer Science and Engineering and accepted in terms of style and content. The presentation has been held on 21th Jan, 2021.

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DECLARATION

We hereby declare that we have done the project under the supervision **Ohidujjaman, Senior Lecturer, Department of Computer Science & Engineering**. We also state that no degree or diploma has been granted for either this project or any aspect of this project elsewhere

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ABSTRACT

Information progress a lot in recent years, Information and Communication Technology (ICT) is based largely on the Internet of Things (IoT). Depending on IoT the real-world circumstance services are improved and utilized in the domestic environment with various apps. Everything in home appliances automation is networked and can run without a human being's Inference. Home automation changes considerably people's lives that offer smart home appliances operations. Also the security of home also very important so we need something more reliable than a traditional door lock or other locks. That's what encouraged us to create a new approach that regulates those homes appliance use such as lighting, fan, Energy consumption with NodeMCU ESP8266,Relay Board and create a fingerprint door lock system for more security we use the Fingerprint sensor, ATmega328P, relay, solenoid lock. In this paper, a security system for a smart home automation is proposed. All over the world, security has been a major concern in every home, so everyone wants secure their own home. In terms of Bangladesh, home security system too much needed for every home. But everyone can't afford a home security system because in our country it is very expensive. In our project, we propose to implement an integrated home automation and security system in a low cost so that everyone can afford this Smart Home Security System. All these data can be interacted with by users on the IoT mobile application platform like Blynk. This paper will serve as an example of how we can build IoT applications at a low cost.

Keywords—Smart home, automation, IoT, sensors, Blynk, Fingerprint.

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INTRODUCTION

1.1 Introduction

Smart home implies automation and control of Electronic appliances that have been found in the home and it's based on IoT. IoT can also be used in various automation applications. Where automation is the method of control Various applications or equipment with little or no human being Interacting. This definition of automation can be used At the home. The lighting system can be used with both lights, within the house, but also in the courtyard, backyard, garage or other various places.

This paper presented a model that has been designed and includes a Door, a living room and bedroom, kitchen. The fingerprint door lock system placed a wall to lock the door. A control device placed anyplace we want. which can be controlled through the mobile app. The door lock will be unlocked when the authorized owner places their index finger on the scanner. Any light Fan can be turned on or off through the mobile application.

1.2 Motivation

All over the world, excessive electrical bills and home security have been a major concern in every home, so everyone wants a system in their home so that they can control their home appliance remotely also secure their own home using a security system which can’t be broken. In terms of Bangladesh, the home security system too much needed for every home. But everyone can’t afford a home security system because in our country it is very expensive.

In our project, we propose to implement integrated home automation and security system at a low cost so that everyone can afford this Smart Home Security System.

1.3 Objectives

We work on this project,

1. To make the digital and easy Home appliance control.
2. To make a secure home security system.
3. To provide Home Security and Automation at a cheap cost

1.4 Features

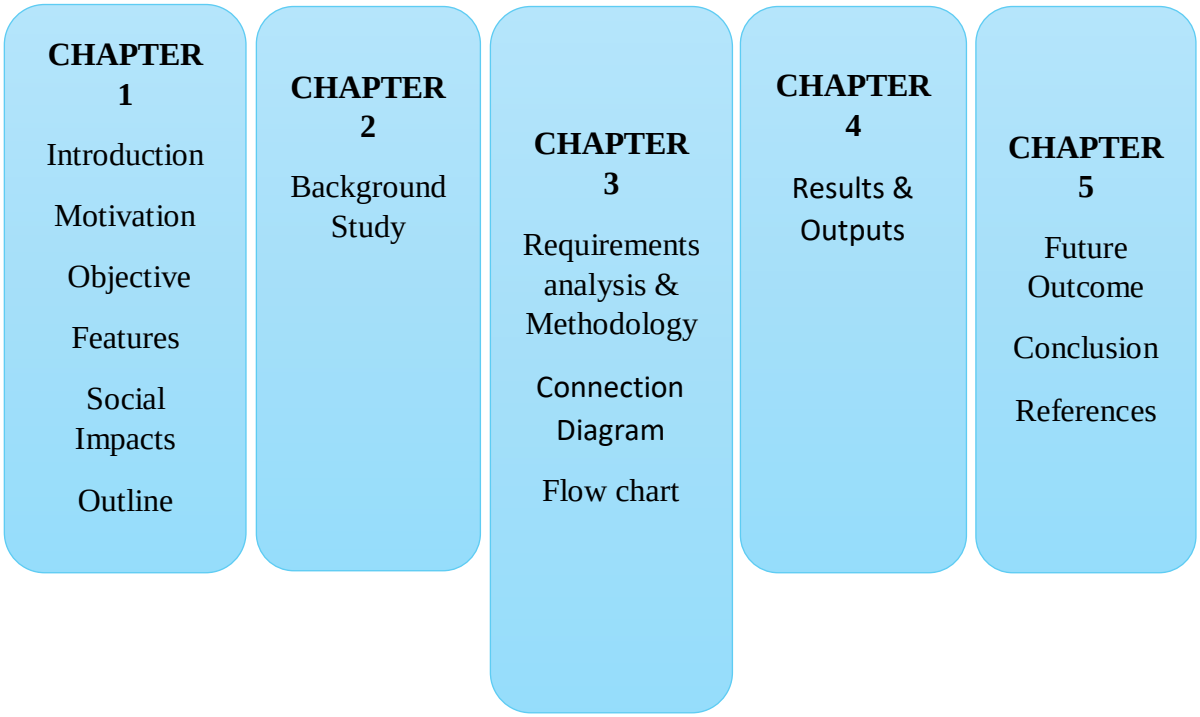
There are some features of application:

1. Fingerprint Door lock.
2. Control Home appliance with a mobile application.

1.5 Social Impact

By means of our project peoples can get a smart home automation and security system at a low cost. This project will help the older peoples more. They can control their home appliance with a smartphone. Through our project, people can also be notified if they have any break in their house. Also, this project is easy to interact so it will be easy to control by the elderly or little children

1.6 Outline



CHAPTER 2
LITERATURE REVIEW

2.0 BACKGROUND STUDY

Many Authors define the features of an ideal Remote access home automation system focused on the GSM-based smart home system we need to send Message or call for operating home appliances control. It has more Time delay and also it's more complicated.

In lot of paper the authors uses the Bluetooth connection for Communication between "smart home appliances" and User. The user uses mobile to control the home appliance remotely e b. The downside of Bluetooth is it has a very short range so it can't be used in long-range. The downside of Bluetooth is it has a very short range so it can't be used in long-range. It also means we can only connect with Bluetooth when our cell phone is in its short range.

The low-cost, versatile, and all-round intelligent home system submitted. This is used by Arduino Ethernet Communicate with the personalized application installed on the device. The system is integrated with different sensors such as humidity Sensors, temperature sensors, gas sensors. All of these are the sensors are operated using mobile applications. The proposed system sent an alert in e-mail notifications, if the specific home application exceeds the threshold stated.

CHAPTER 3

REQUIREMENTS ANALYSIS & METHODOLOGY

3.1 Requirements

Hardware Requirements:

1.Arduino UNO
2.Fingerprint Scanner
3.NodeMCU ESP8266
4.Solenoid lock
5.Relay Board
6.Bread Board
7.Jumper wire

Software Requirements:

1. Arduino IDE

2. Blynk Mobile Application

3.2 3.2 Connection Diagram

3.2.1 Door lock:

Arduino	**Fingerprint Scanner**
Pin 2	TX
Pin 3	RX
3.3v	VCC
GND	GND

Arduino	**Relay board**
5v	VCC
GND	GND
Pin 8	Data Pin1/IN 1

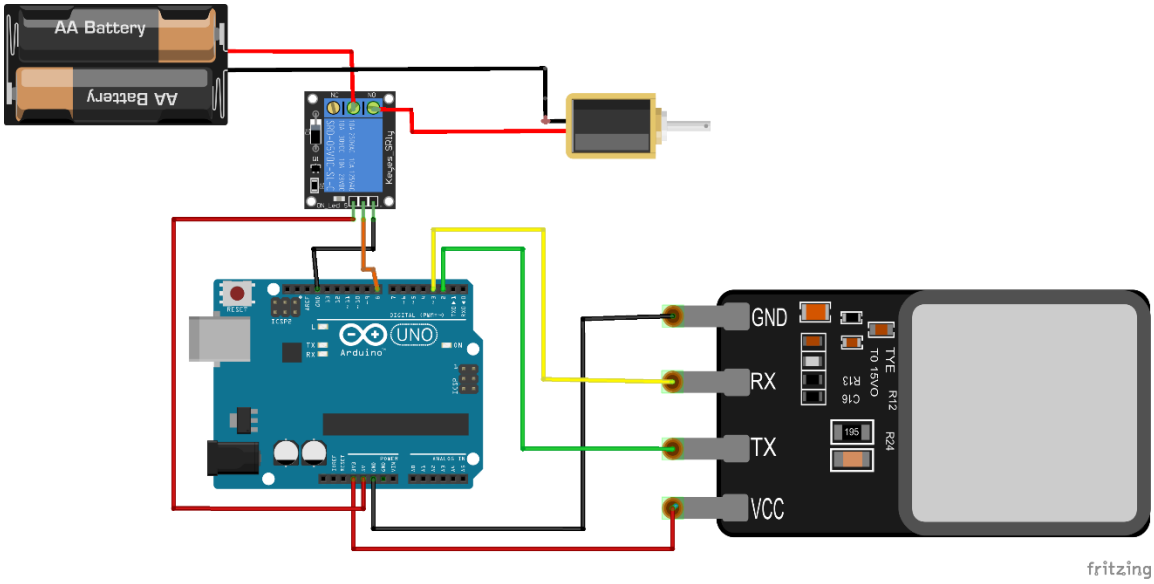


Fig: Fingerprint Door Lock

3.2.2 Home Automation

Nodemcu ESP8266	**Relay Board**
D0	Data Pin1/IN 1
D1	Data Pin2/IN 2
D2	Data Pin3/IN 3
D3	Data Pin4/IN 4
Vin	VCC
GND	GND

USB-B port	**NodeMcu ESP8266**
Positive	3.3v,
Negative	GND

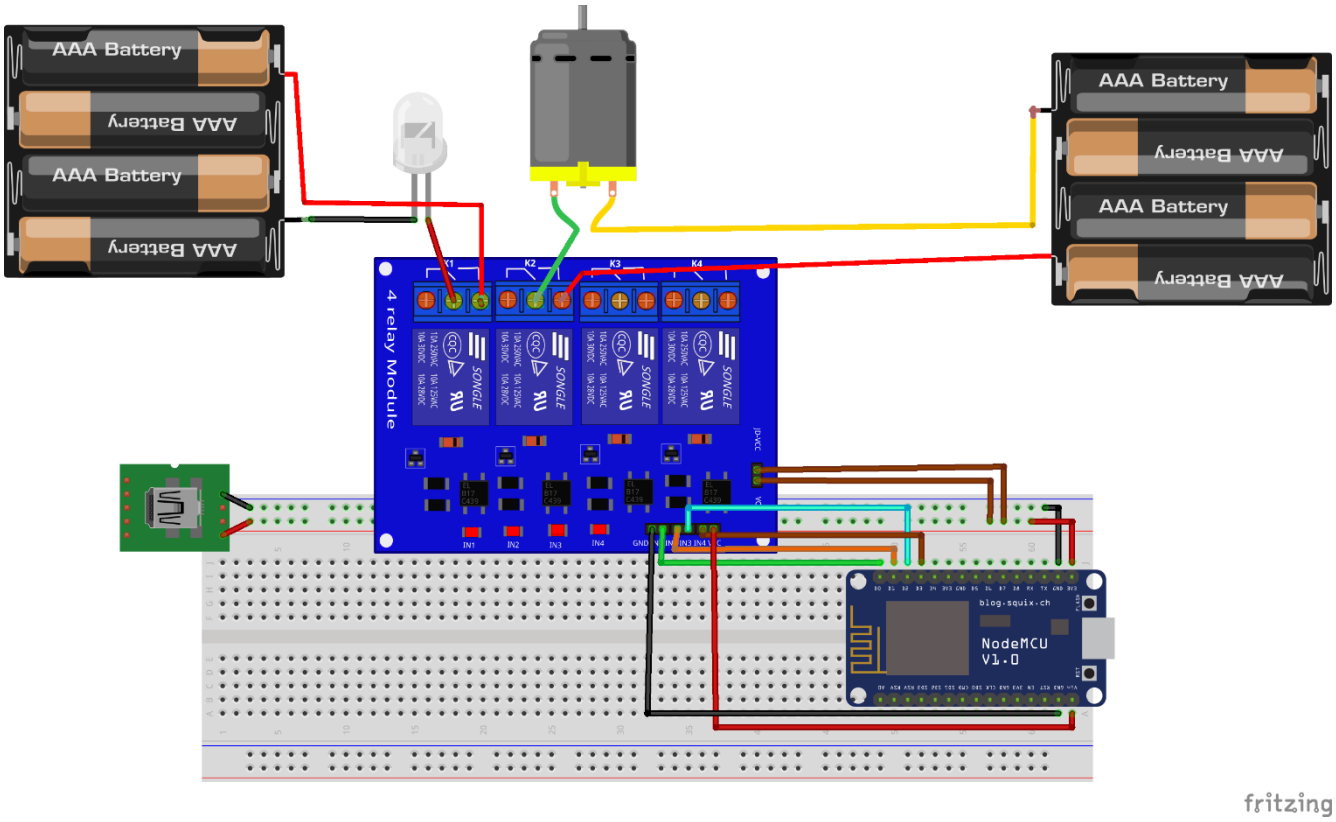


Fig: NodeMcu And Relay Board Connection

3.3 Flow Charts

3.3.1 Flow Chart Enrolled Fingerprint

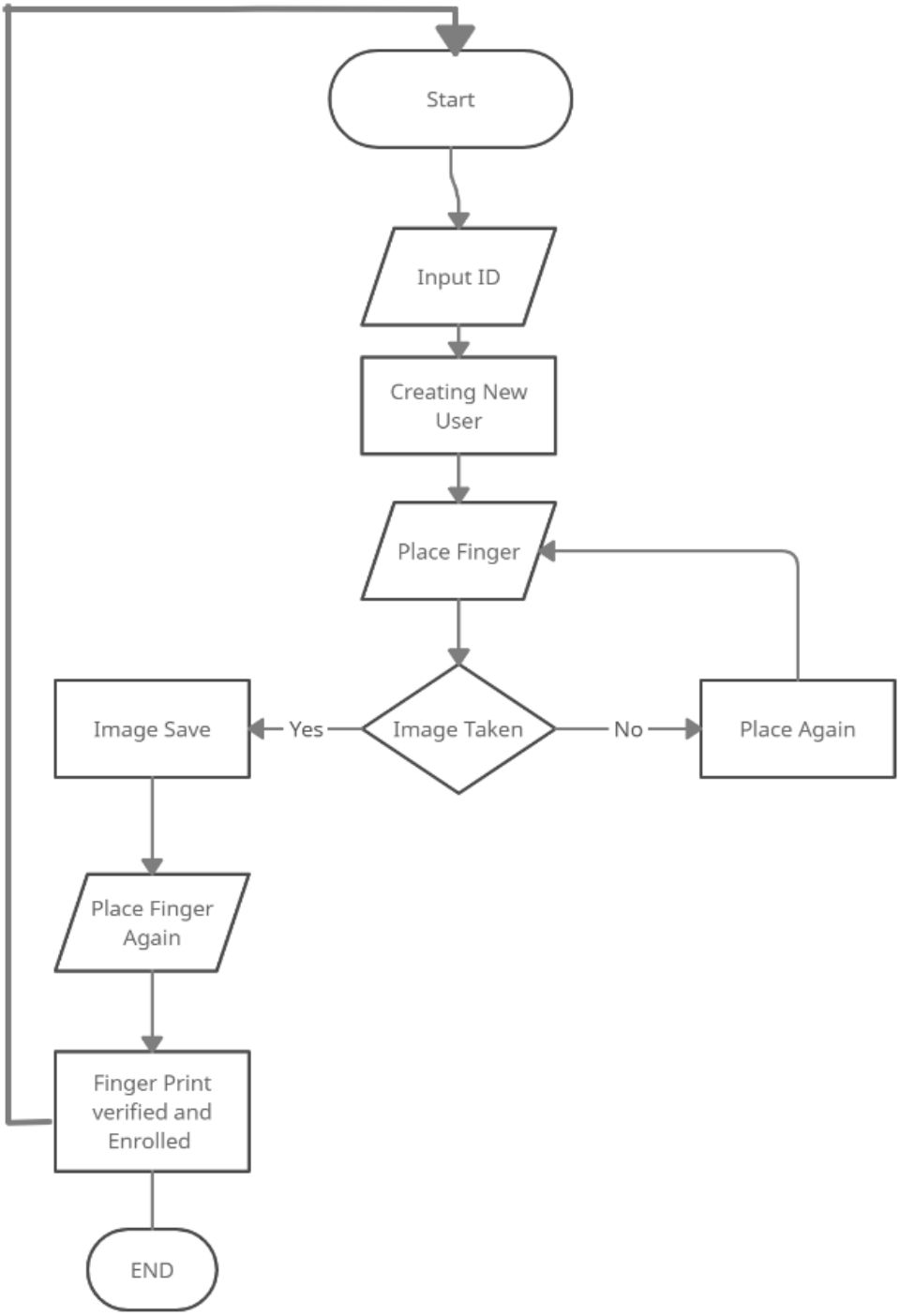


Fig 3.3.1: Fingerprint Enrolled

3.3.2 Flow Chart for Unlocked The Door

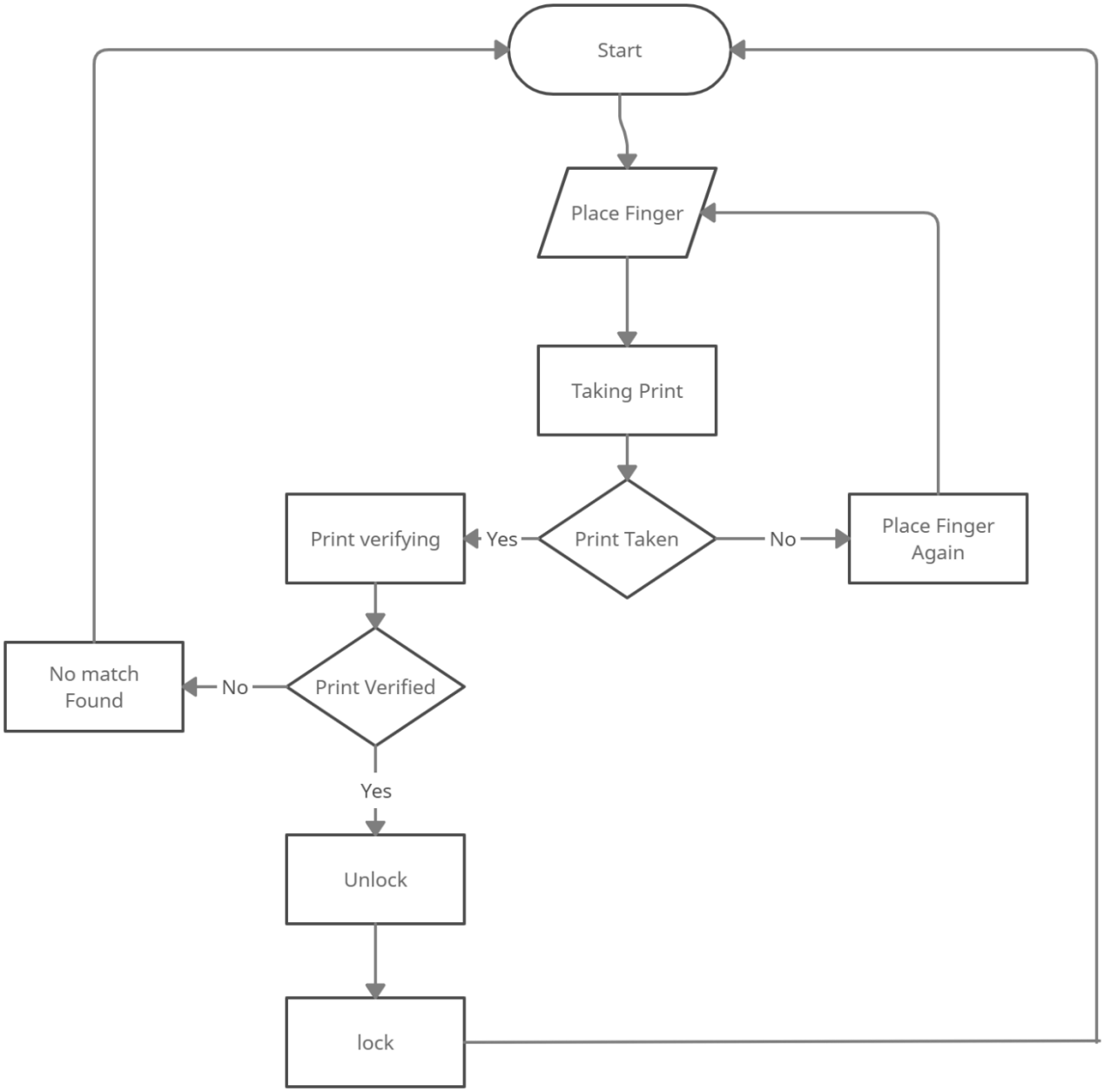


Fig 3.2.2: Unlocked Door

3.3.3 Flow Chart for Control the Light/Fan Switch

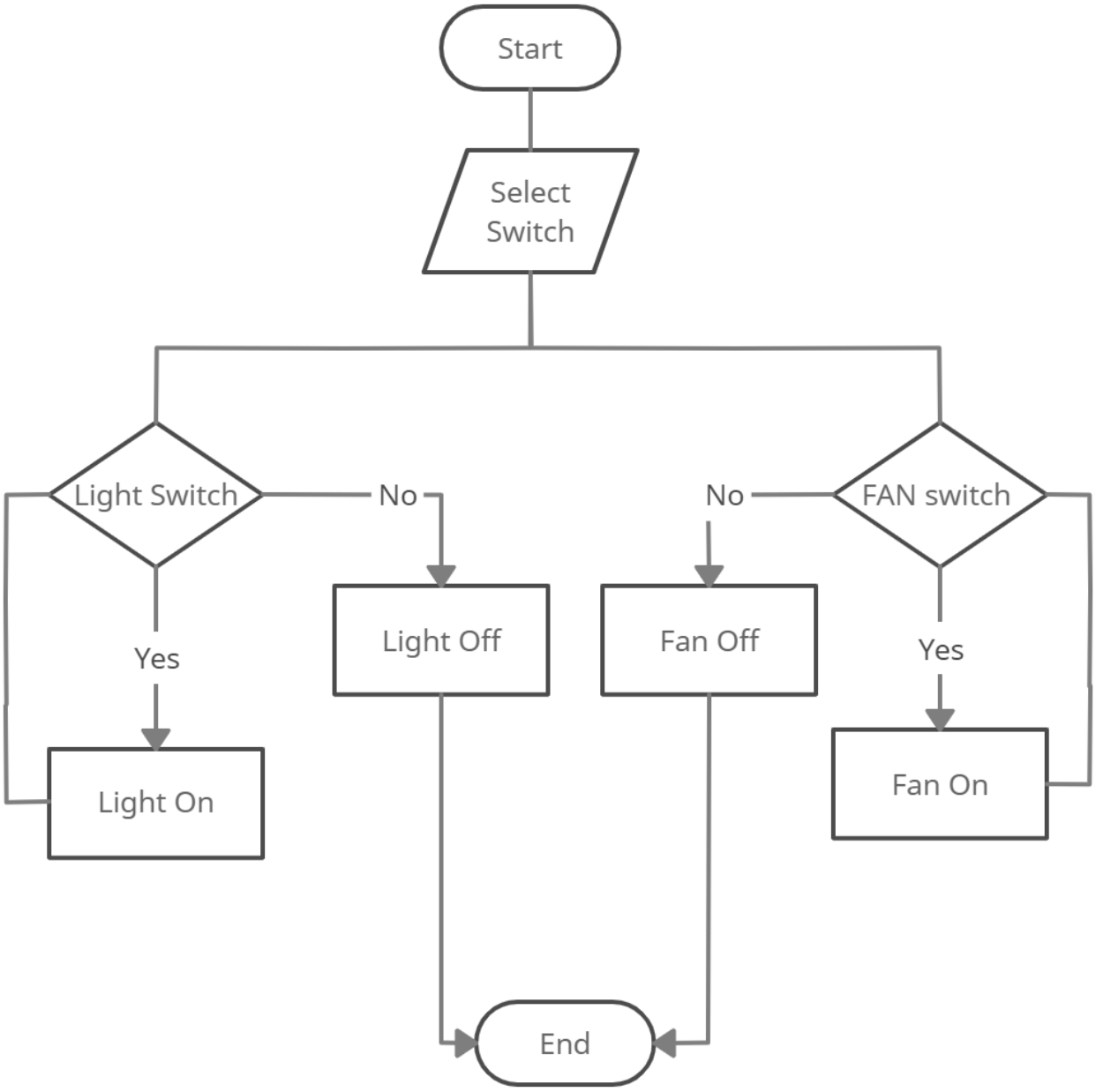


Fig 3.3.3: Light/Fan Control

CHAPTER 4

RESULTS AND OUTPUTS

4.1 Blynk App Interface

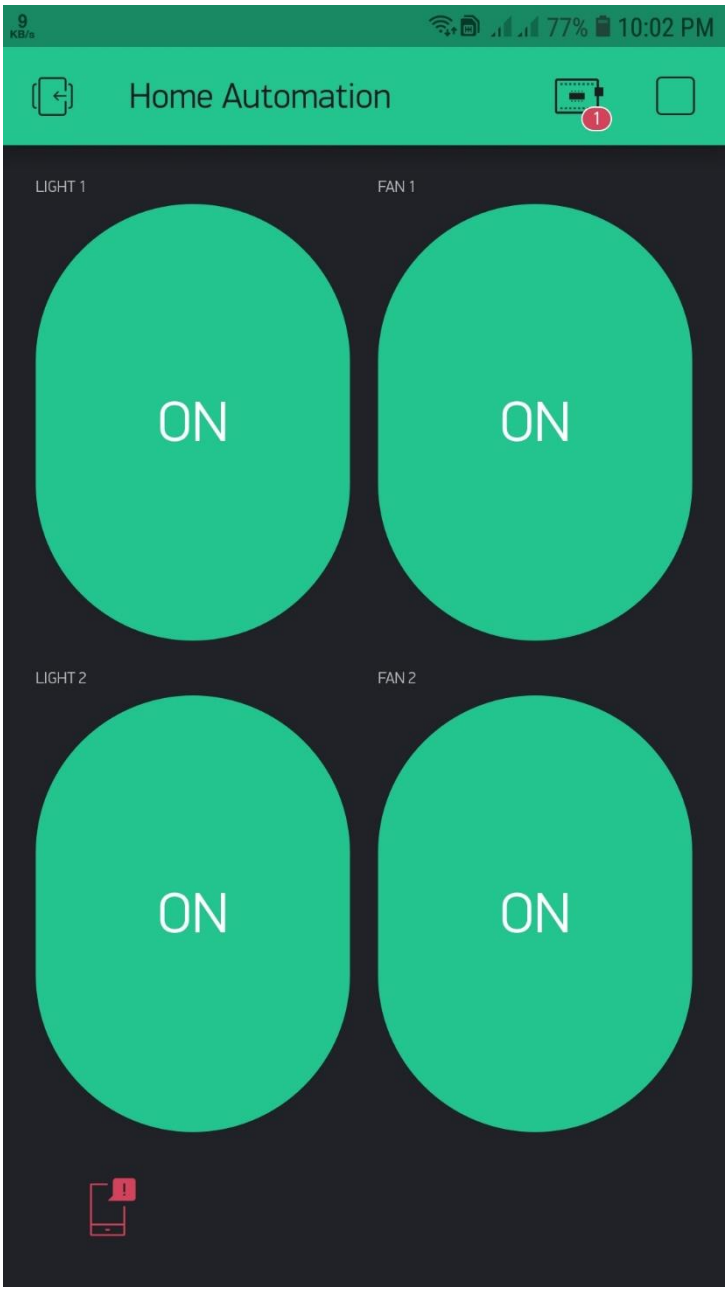


Fig 4.1: Blynk App for Control Light/Fan

4.2 Full Project Image

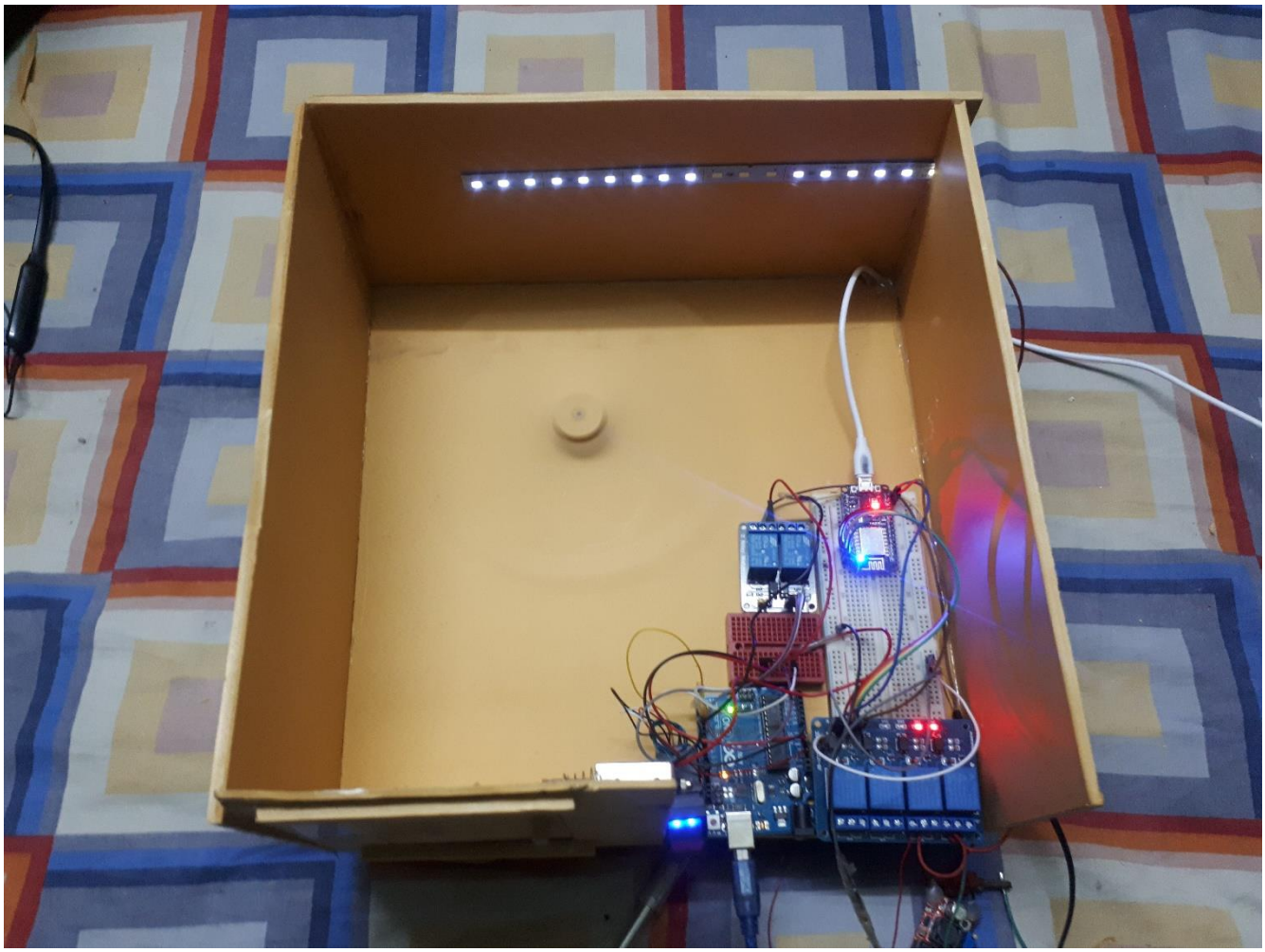


Fig4.2: Full Project light/fan both on

CHAPTER 5

CONCLUSION & FUTURE OUTCOME

5.1 Future Outcome

By means of our application people can get daily necessary medicines home delivery. Also, they can measure heart rate by means of this application. In future we will add some more features like medicines reminder, nearby medicines shops, most selling medicines in one area etc. By means of most selling medicines analysis we will determine the diseases occurring in that particular area. Also we will increase our database.

5.2 Conclusion

By means of our project we tried to make the medicine buying system easy and digital for all the people in our country. In this era most of the people are using smartphone and online shopping is becoming popular day by day. So we hope that our application "Medicine Hawker" will help everyone to buy medicines online and get home delivery. Also we added heart rate measure option in our application. For using this feature no need to download another app. We believe that people will be benefited and that will be our success.

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