

Chapter 1:

1.1 Company Profile :

Flowian Founded in 2013, it provides transformative business process solutions across multiple industries and business functions. Based in Pune, India, Flowian helps its customers across 3 continents achieve complete visibility, control and effectiveness of business operations.

Flowian is a process innovation solutions provider that helps customers achieve complete visibility, control and effectiveness into their business operations. The product and services portfolio is a blend of, domain consulting, cloud-based automation, and industry focused solutions.

At the core of Flowian's portfolio is its Business Process Management services that leverage deep process expertise blended with proven skills on BPM technology platforms. Flowian brings forth innovative solution ideas, through a foundational pedigree in cloud technologies and platforms.

Flowian has long-term partnerships with the leaders in BPM platform and cloud technologies available in the world today.

Flowian has emerged as a trusted partner to both its clients and platform providers, owing to its ability to articulate technology value to key stakeholders in

business functions. Solutions across areas of Finance, HR, Supply Chain and CRM have been well appreciated by function heads of our client's businesses.

1.2 Existing System & Need for System

Existing System :

Now a day's Technology is changing so rapidly. These technologies are now changing their focus on Internet of thing so that they can control the devices presents on remote location.

There are some existing system presents in the market and rapidly moving towards setting a culture and improving lifestyle of their users.

One of the major name in this type is OpenHAB , Home Assistant , Domoticz , Calaos Are the leading companies.

These companies are setting up a tone on Open source software to attract Customers as well as Developers.

Need for System :

The **Raspberry Pi** is a credit-card-sized computer that plugs into your TV and a keyboard. It is a capable little computer which can be used in electronics projects, and for many of the things that your desktop PC does, like spreadsheets, word processing, browsing the internet, and playing games.

In simple words a **smart home** is the one in which the devices have the capability to communicate with each other as well as to their intangible environment. A smart home gives owner the capability to customize and control home environment for increased security and efficient energy management. There are hundreds of **IOT technologies** available for monitoring and building smart homes.

Raspberry pi is itself an operating system we can say that it is a small computer we can perform many functionalities with the help of that device. This is a technology that is rapidly growing into industries and very popular these days.

1.3 Scope Of Work

- Web application as well as mobile application
- Customer can login
- Administrative Login
- Help customer to turn off and turn on lights
- All these functionalities working on raspberry pi device
- We can access and manage functionalities
- Add customer
- Update customer
- Working test that each functionalities are working
- Report Generation

1.4 Operating Environment – Hardware and Software

Hardware:

- Raspberry pi
- Electronic equipment
- Bread board
- Relay circuit
- Transistor
- register
- Computer (500Gb Hard Disk, min 4GB ram, Windows 10)

Software:

- PHP
- Eclipse
- HTML
- CSS
- MYSQL
- Apache Tomcat

1.5 Description of Used Technology

SOFTWARE TECHNOLOGY

PHP :

The PHP Hypertext Preprocessor (PHP) is a programming language that allows web developers to create dynamic content that interacts with databases. PHP is basically used for developing web based software applications. This tutorial helps you to build your base with PHP.

PHP is a server-side scripting language designed primarily for web development but also used as a general-purpose programming language. Originally created by Rasmus Lerdorf in 1994, The PHP reference implementation is now produced by The PHP Development Team. PHP originally stood for Personal Home Page, but it now stands for the recursive acronym PHP: Hypertext Preprocessor

Many high-profile open-source projects ceased to support PHP 4 in new code as of February 5, 2008, because of the GoPHP5 initiative, provided by a consortium of PHP developers promoting the transition from PHP 4 to PHP 5.

Basically, PHP allows a static webpage to become dynamic. The word “Pre-processor”.

Means that PHP makes changes before the HTML page is created. This enables developers to create powerful applications that can publish a blog, remotely control hardware, or run a powerful website such as Wikipedia or face book. The need a database applications such as MYSQL.

Before you embark on the wonderful journey of server side processing, it is recommended that you have a basic understanding of the Hypertext makeup Language (HTML). But PHP can also be used to build GUI-driven application.

HTML :

Hypertext Markup Language, commonly referred to as HTML, is the standard markup language used to create web pages. Along with CSS, and JavaScript, HTML is a cornerstone technology, used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications. Web browsers can read HTML files and render them into visible or audible web pages. HTML describes the structure of a website semantically along with cues for presentation, making it a markup language, rather than a programming language.

HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items.

The language is written in the form of HTML elements consisting of *tags* enclosed in angle brackets (like `<html>`). Browsers do not display the HTML tags and scripts, but use them to interpret the content of the page.

HTML can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages. Web browsers can also refer to Cascading Style Sheets (CSS) to define the look and layout of text and other material. The World Wide Web Consortium (W3C), maintainer of both the HTML and the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.

CSS :

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language.^[1] Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

CSS is designed primarily to enable the separation of document content from document presentation, including aspects such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition in the structural content, such as semantically insignificant tables that were widely used to format pages before consistent CSS rendering was available in all major browsers. CSS makes it possible to separate presentation instructions from the HTML content in a separate file or style section of the HTML file. For each matching HTML element, it provides a list of formatting instructions. For example, a CSS rule might specify that "all heading 1 elements should be bold", leaving pure semantic HTML markup that asserts "this text is a level 1 heading"

without formatting code such as a `<bold>` tag indicating how such text should be displayed.

This separation of formatting and content makes it possible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (when read out by a speech-based browser or screen reader) and on Braille-based, tactile devices. It can also be used to display the web page differently depending on the screen size or device on which it is being viewed. Although the author of a web page typically links to a CSS file within the markup file, readers can specify a different style sheet, such as a CSS file stored on their own computer, to override the one the author has specified. If the author or the reader did not link the document to a style sheet, the default style of the browser will be applied. Another advantage of CSS is that aesthetic changes to the graphic design of a document (or hundreds of documents) can be applied quickly and easily, by editing a few lines in one file, rather than by a laborious (and thus expensive) process of crawling over every document line by line, changing markup.

The CSS specification describes a priority scheme to determine which style rules apply if more than one rule matches against a particular element. In this so-called cascade, priorities (or weights) are calculated and assigned to rules, so that the results are predictable.

HARDWARE TECHNOLOGY

Raspberry pi:-

- Here we are using raspberry pi version 3.0 with model b+.
- To communicating with different electronic components we need separate operating system for raspberry pi.
- Here we are using raspbian - jessie as an operating system.
- Then there are some GPIO (general purpose input and output) pins are also present in that to communicate with we need JUMPING wires which are presents in 3 different types.
- To form better understanding with those we are downloading there packages on terminal and installing on raspberry pi device.
- We can communicate with pi device using Jumping nodes.
- There is way one way which is we can connect using Bread Board There are few GPIO pins available on pi device but we can communicate with them in easy manner.

Relay circuit :

- Relays are electromechanical devices that use an electromagnet to operate a pair of movable contacts from an open position to a closed position.
- The advantage of relays is that it takes a relatively small amount of power to operate the relay coil, but the relay itself can be used to control motors, heaters, lamps or AC circuits which themselves can draw a lot more electrical power.
- The electro-mechanical relay is an output device (actuator) which comes in a whole host of shapes, sizes and designs, and has many uses and applications in electronic circuits. But while electrical relays can be used to allow low power electronic or computer type circuits to switch relatively high currents or voltages both (ON-OFF), some form of **Relay switch circuit** is required to control it.
- The design and types of relay switching circuits is huge, but many small electronic projects use transistors and MOSFETs as their main switching device as the transistor can provide fast DC switching (ON-OFF) control of the relay coil from a variety of input sources so here is a small collection of some of the more common ways of switching relays.

Chapter 2

2.1 Proposed System:

Module 1: Login

Login module provides for 2 options, Admin Login and Customer login.

Admin Login:

Administrator login provides for login that is restricted only for authorized personnel. These personnel are responsible to push available data to a central repository and pull data through it. Admin personnel are also given option of editing features like remove Customer, add Customer and perform functionalities.

Customer Login:

Customer login into the system as per there need they can turn on and turn off services provided by the system ex. Lights, fan, camera,

Using this customer can watch feed on camera.

These modules primarily design for raspberry pi in coordination with web-view With the help of python language.

The web-view is an app that helps Android load unsupported files such as HTML and JavaScript etc.

1.2 Objectives of System:

- The main objective of the system is to control the home equipment that are working on electricity.
- Ease of use and reduce the work.
- Create a application and sell it customer so that they can Implement it on their home and make them smart
- Feed using camera
- Control electronic equipment
- This application for builder who want to implement and need to be updated in the technologies and build smart home

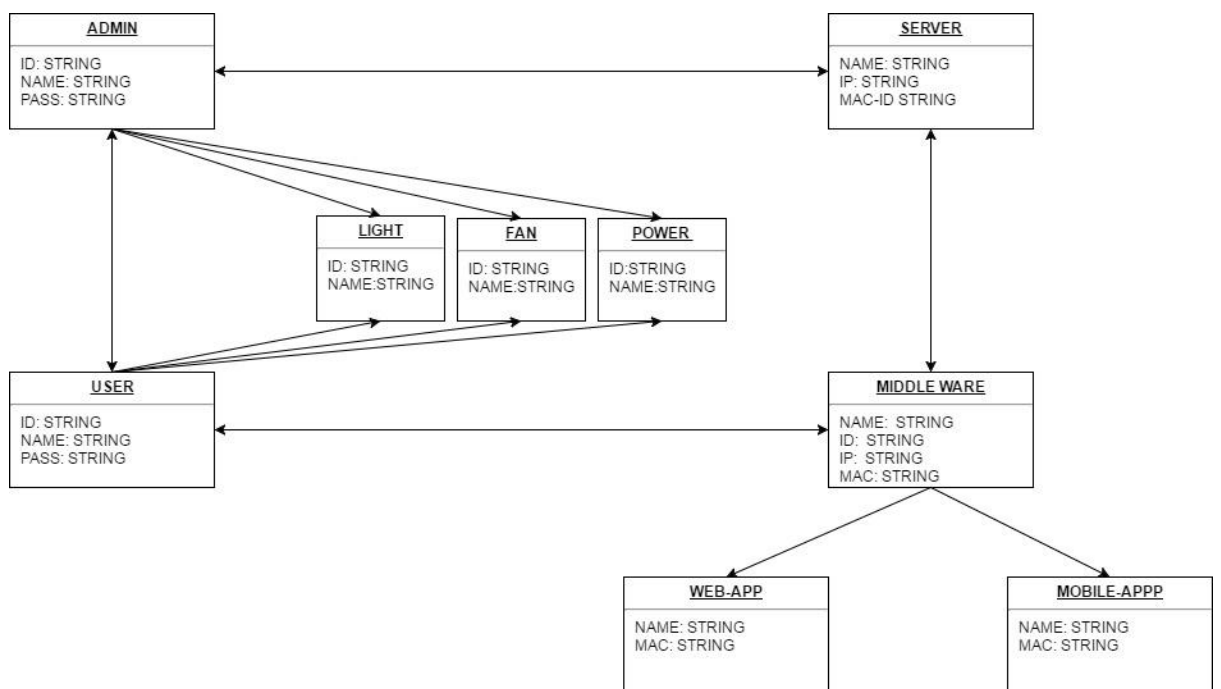
2.3 User Requirements:

Administrator Requirement:

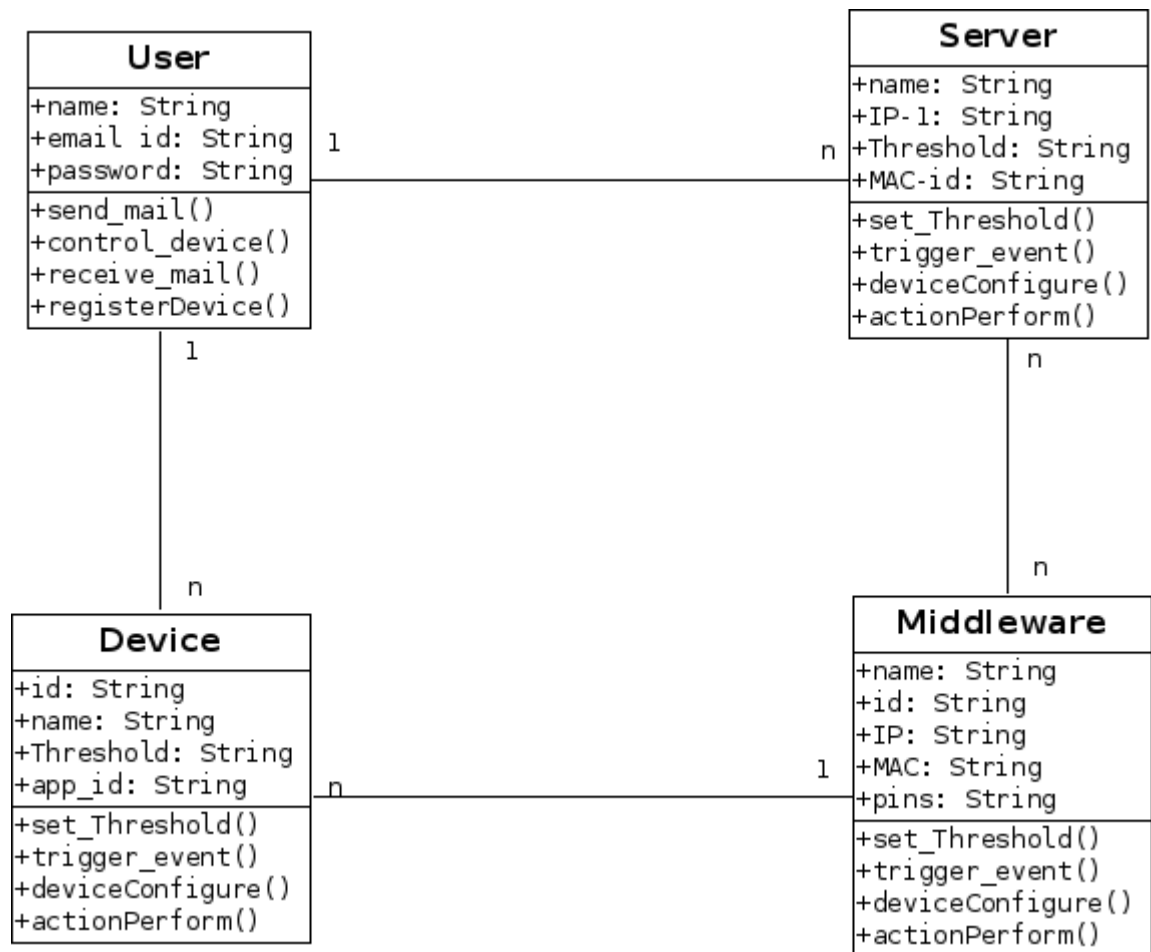
- Ability to control the electronic equipment
- Ability to add customer
- Ability to manage the customer
- Ability to take photos of home
- Ability to remotely monitor home
- Platform controlling smart home.
- Report generation.

CHAPTER 3 : ANALYSIS & DESIGN

3.1 Object Diagram :

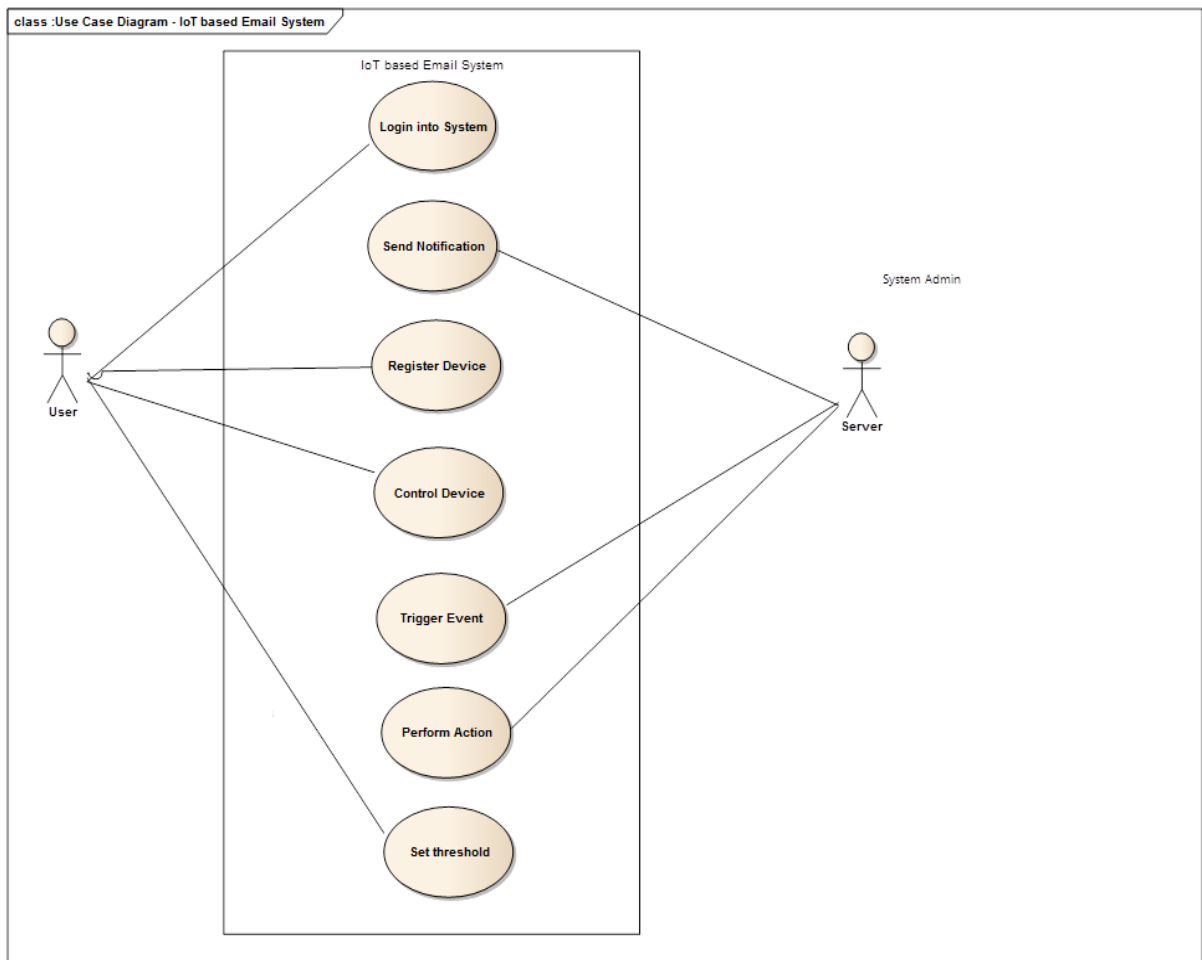


3.2 : Class Diagram :



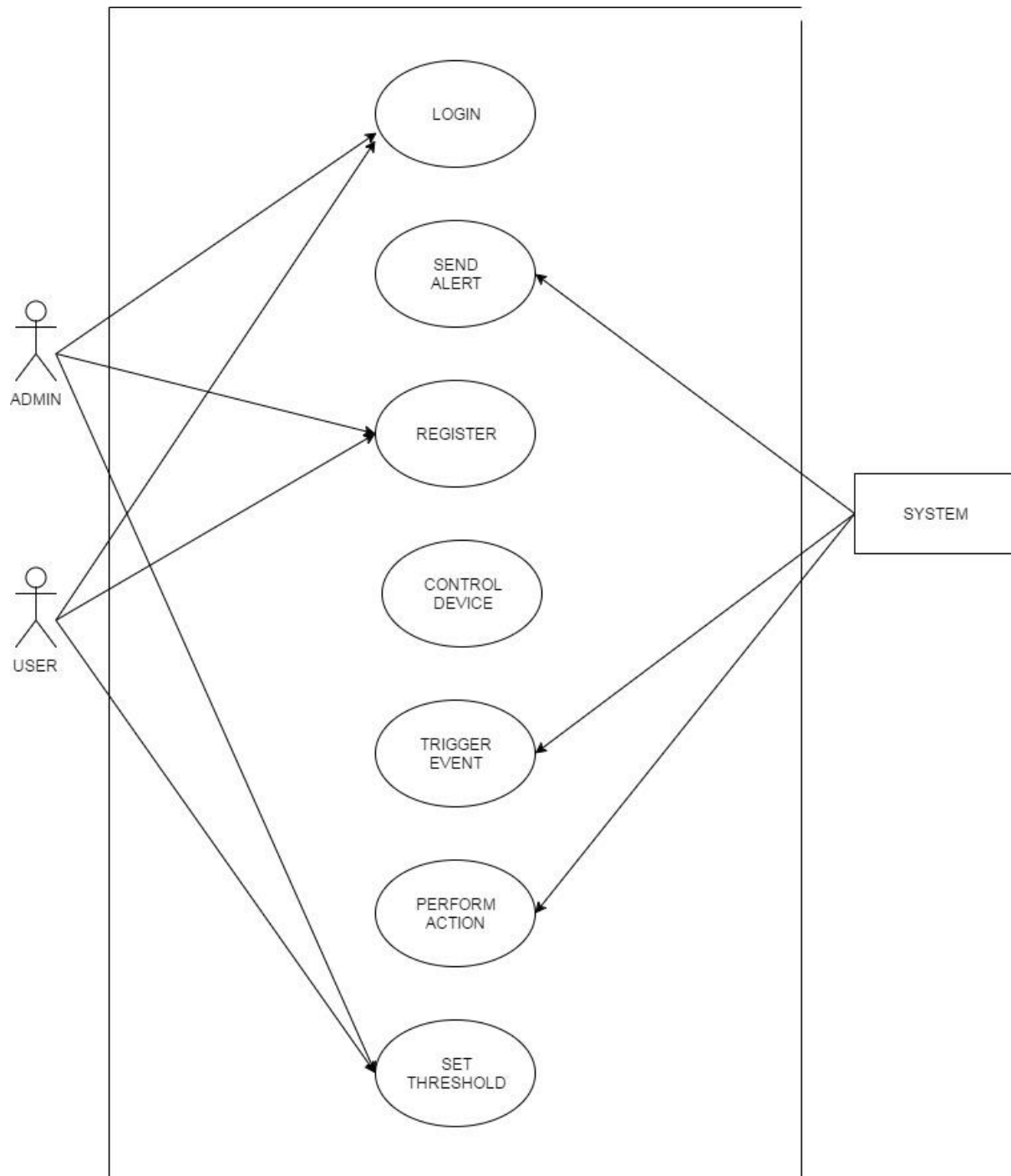
3.3 Use Case Diagram

Use case diagram user level:

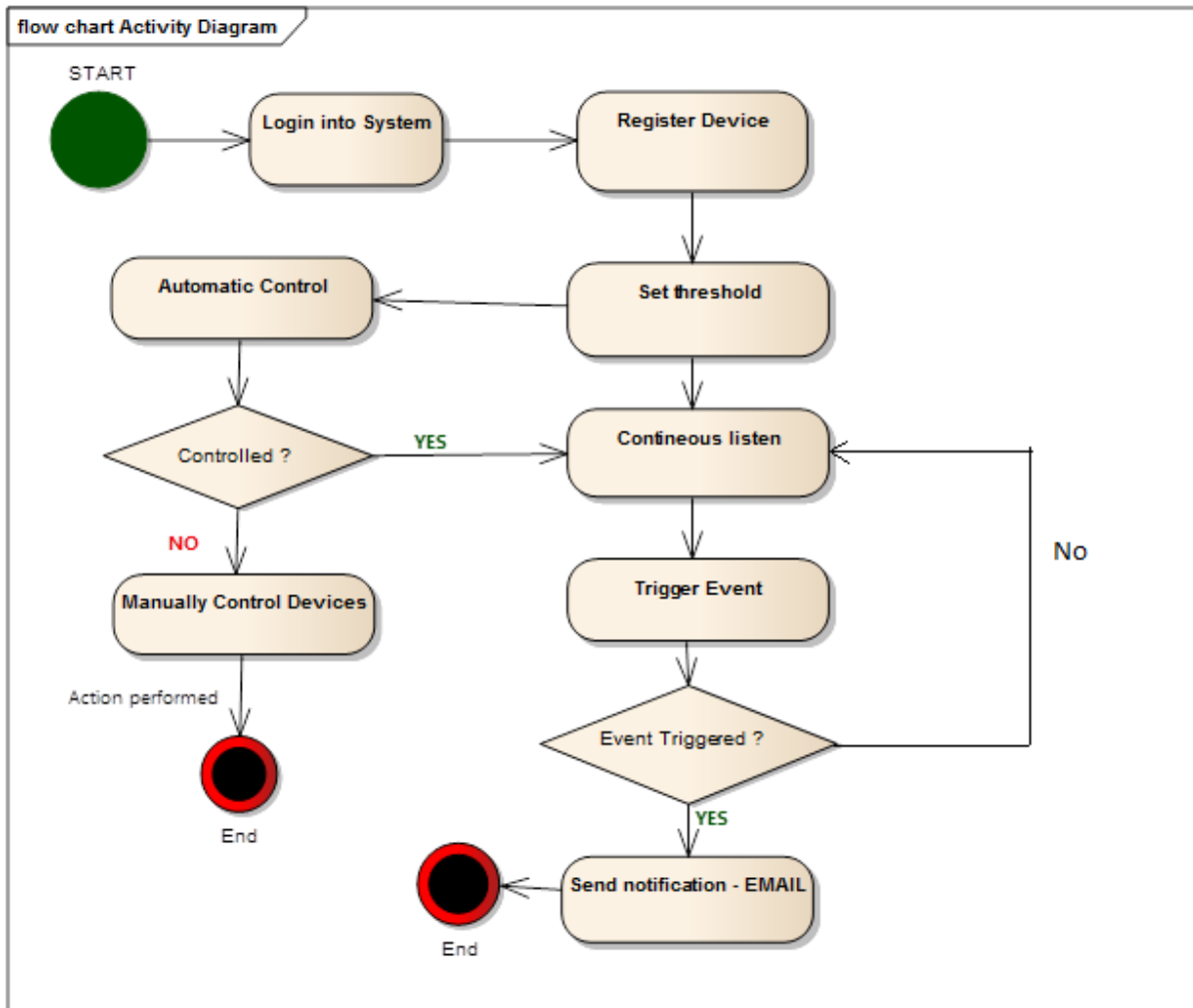


Use case diagram system

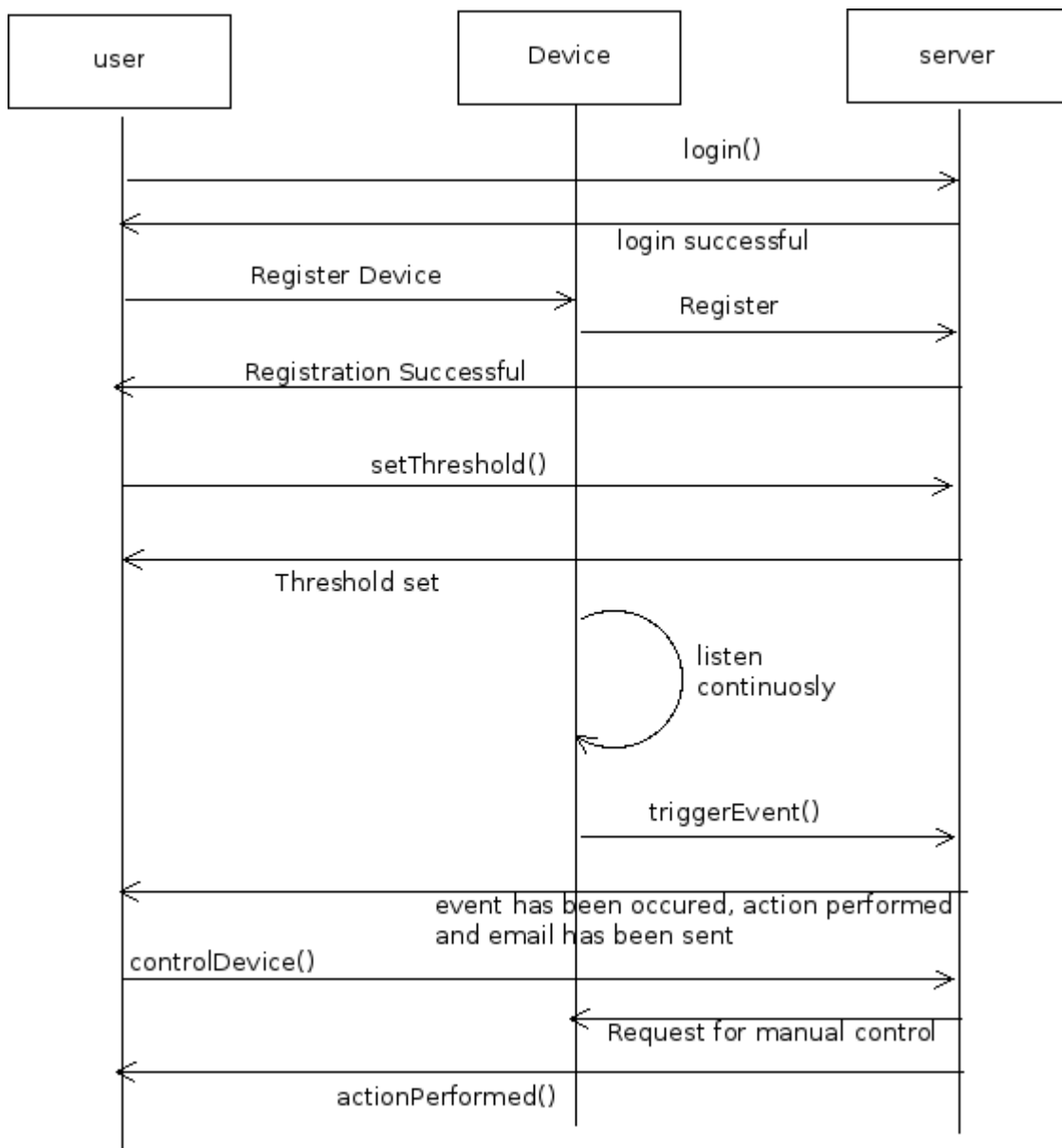
level:



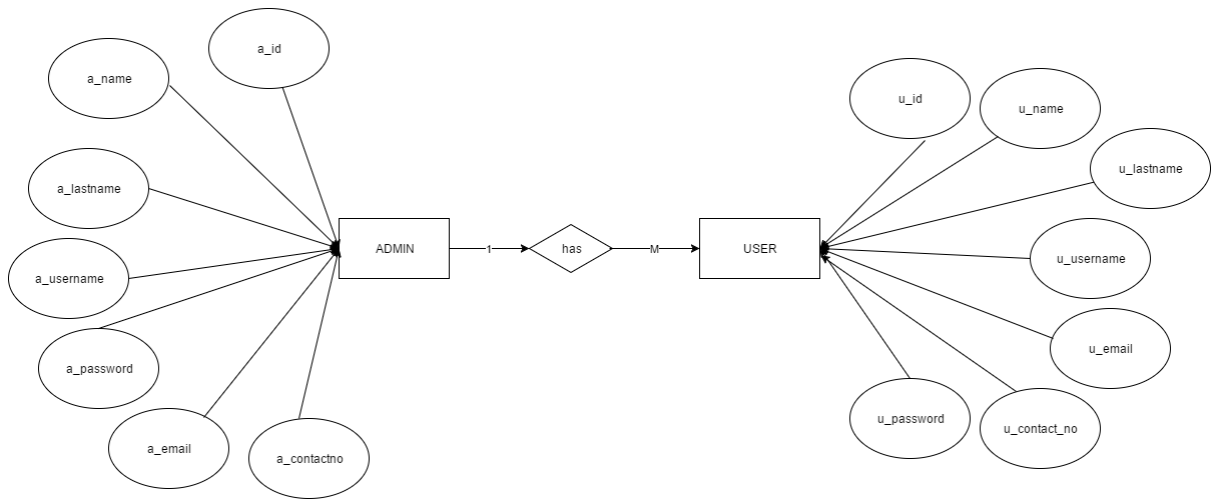
3.4 Activity Diagram



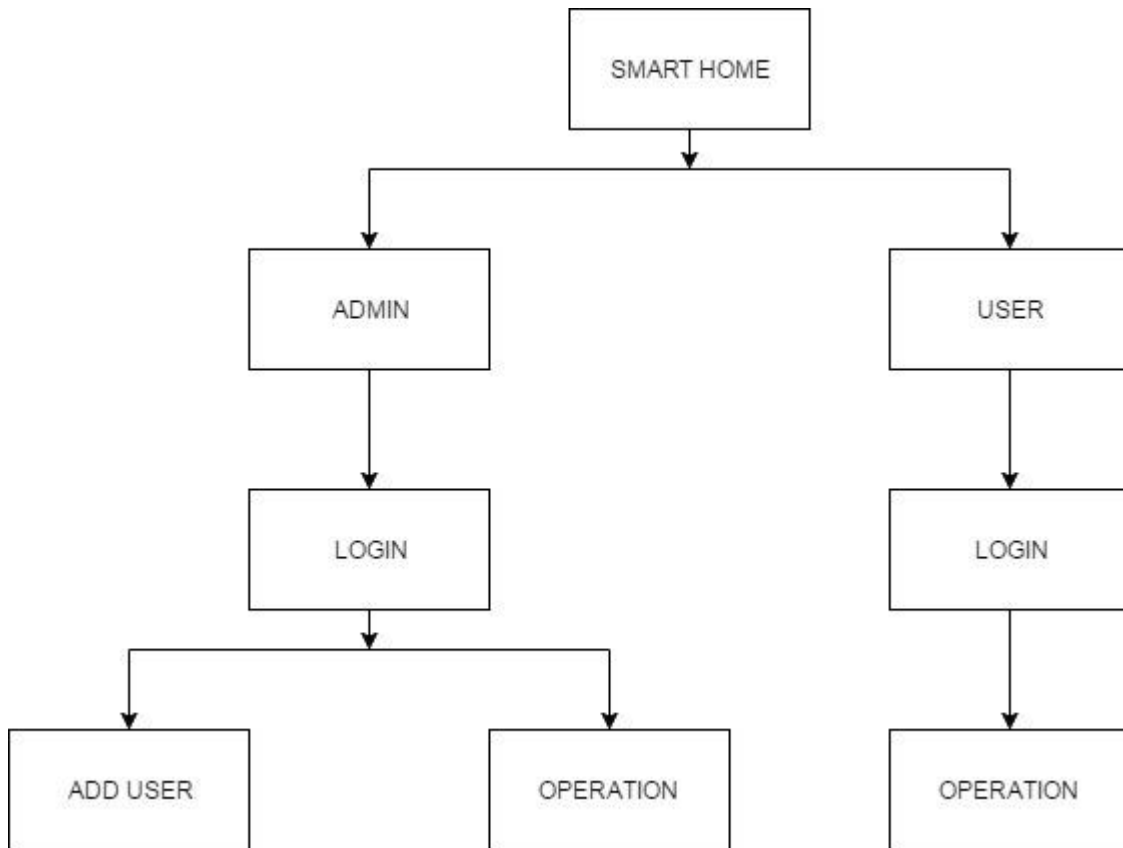
3.5 Sequence Diagram :



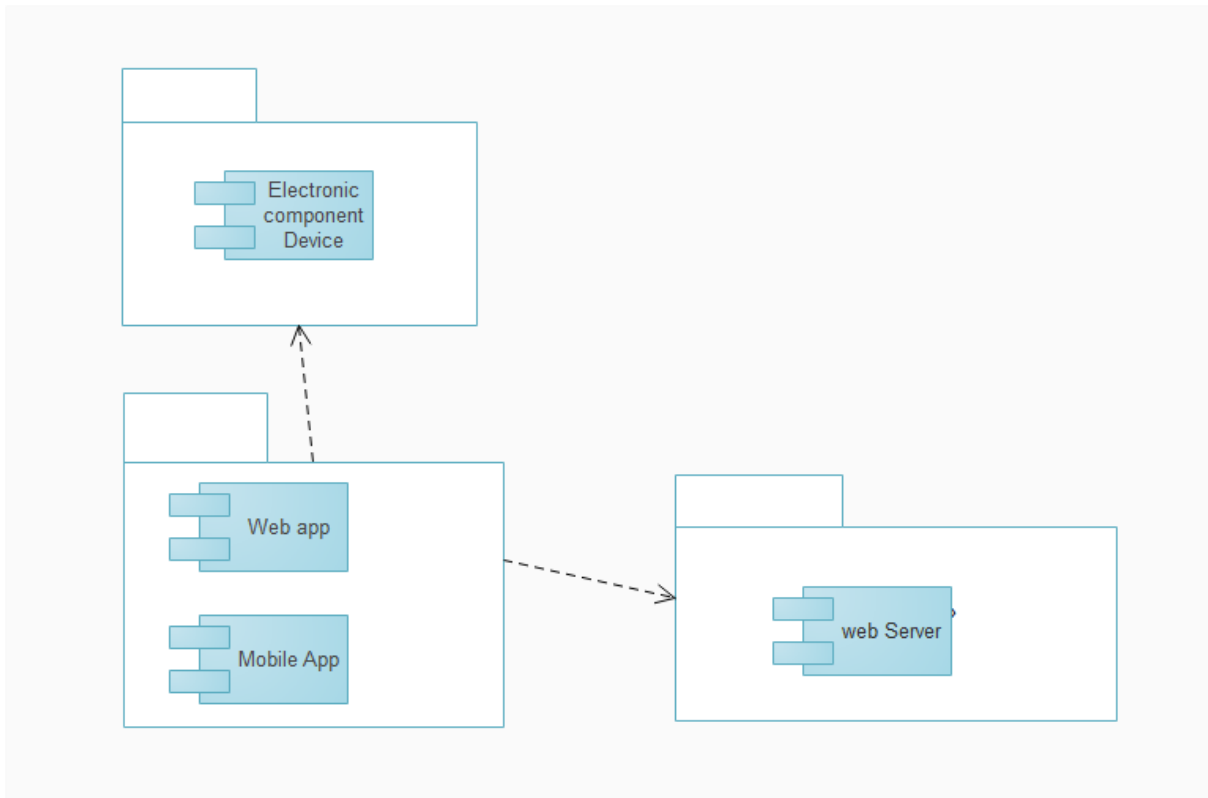
3.6 Entity Relationship Diagram :



3.7 Module Hierarchy Diagram :



3.8 Component Diagram :



3.10 Module Specifications :

1] Admin Module :

- Admin can register user with his credential
- Admin can manage the circuit
- He can turn on and turn off the lights
- He can setup lighting
- He can control speed of fan
- He can turn on and turn off fan

2] User Module :

- User can manage the circuit
- He can turn on and turn off the lights
- He can setup lighting
- He can control speed of fan
- He can turn on and turn off fan
- If he want can control power switch

3] Login Module :

- Person can login into the system
- Person can logout into the system
- If forgot password person can retrieve that password
- there is no way to gate pass this module and enter into the system
- whenever person logout he automatically brought back to Login page

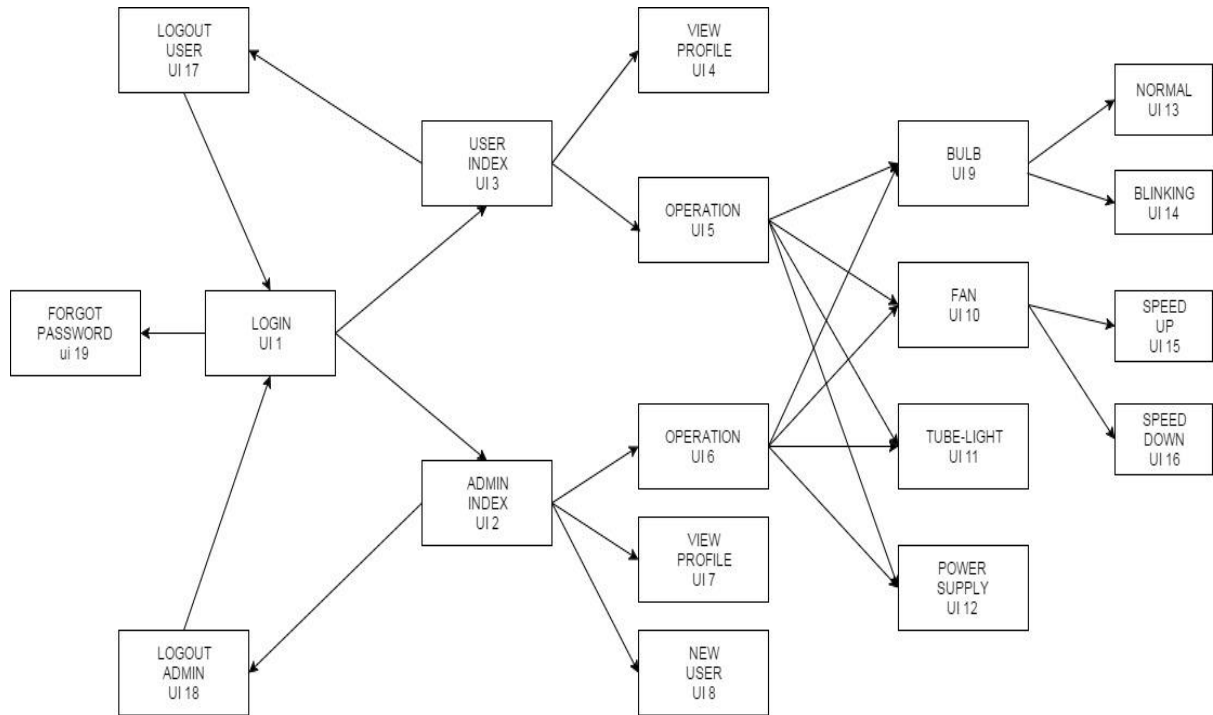
4] Add User :

- Here only Admin has the authority to add User
- Admin has some separate module where a proper registration form is maintained
- Admin can also see the list of User he added into the system

5] Operation :

- Here person can interact with real time bulb, tube-light so that they can perform
- Operation is perform using relays they connected
- So that we can perform operations like Turn-on and Turn-off

3.11 User Interface Diagram :



LOGIN PAGE:-



LOGIN

USERNAME:

PASSWORD:

LOGIN PAGE FOR MOBILE :



SMART HOME



LOGIN

USERNAME:

PASSWORD:

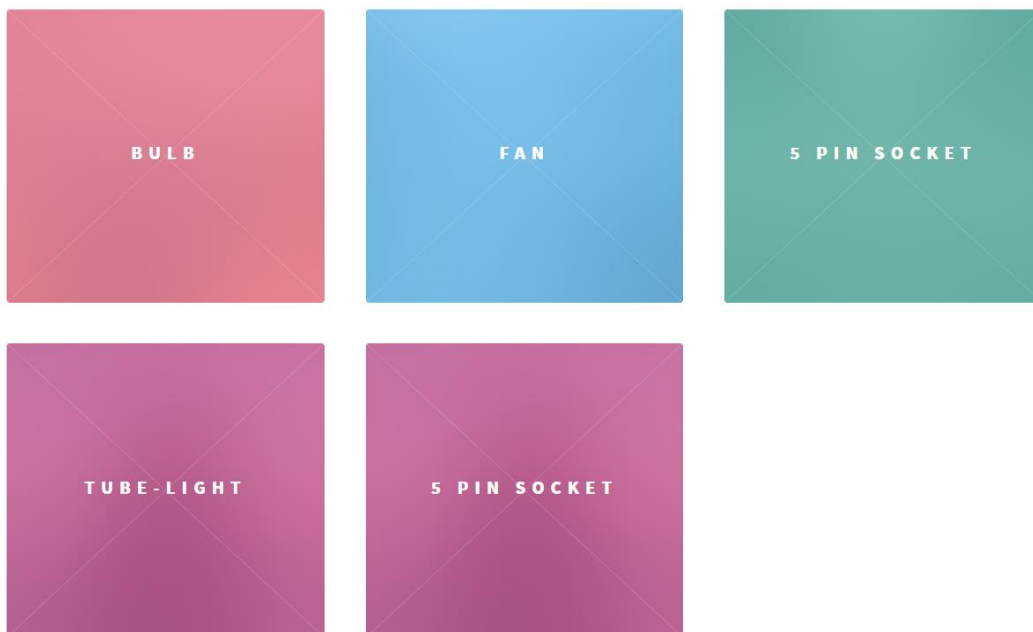
SUBMIT

Index page for ADMIN:-



Welcome ADMIN

This is SMART HOME, Using Raspberry pi



CONTACT US

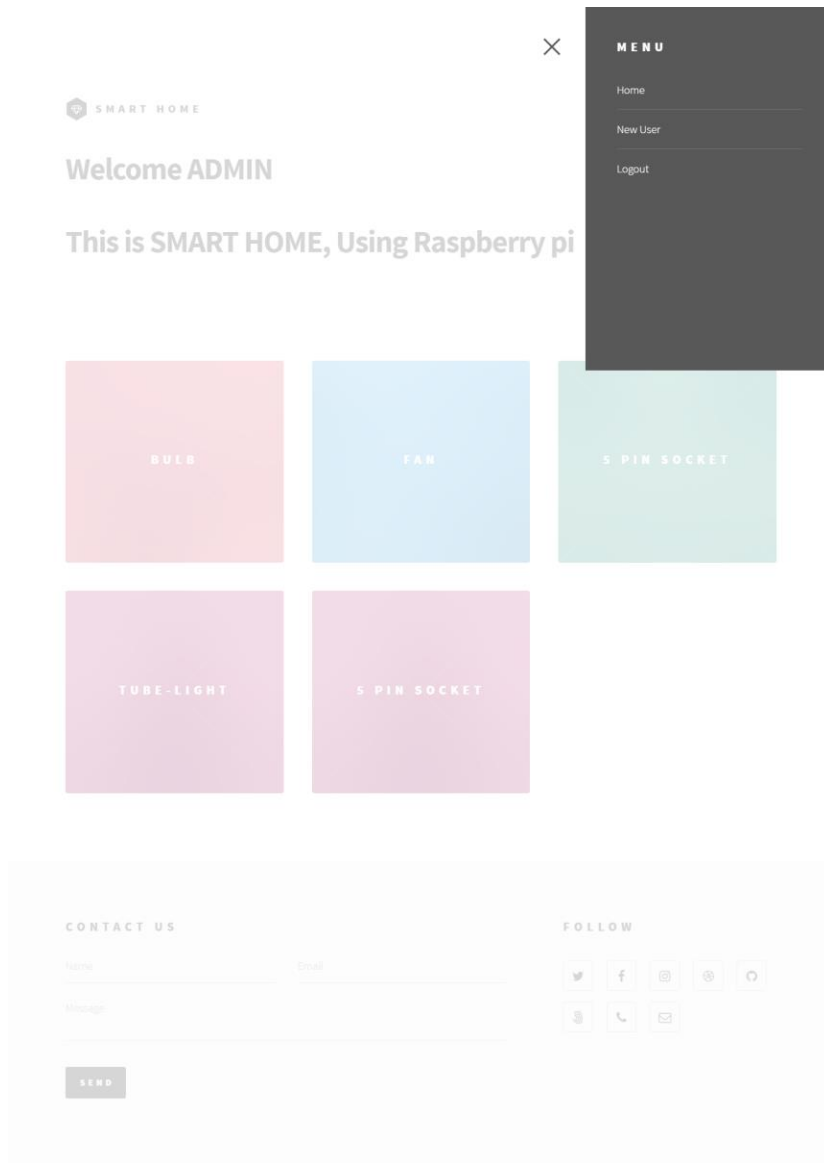
Name Email

Message

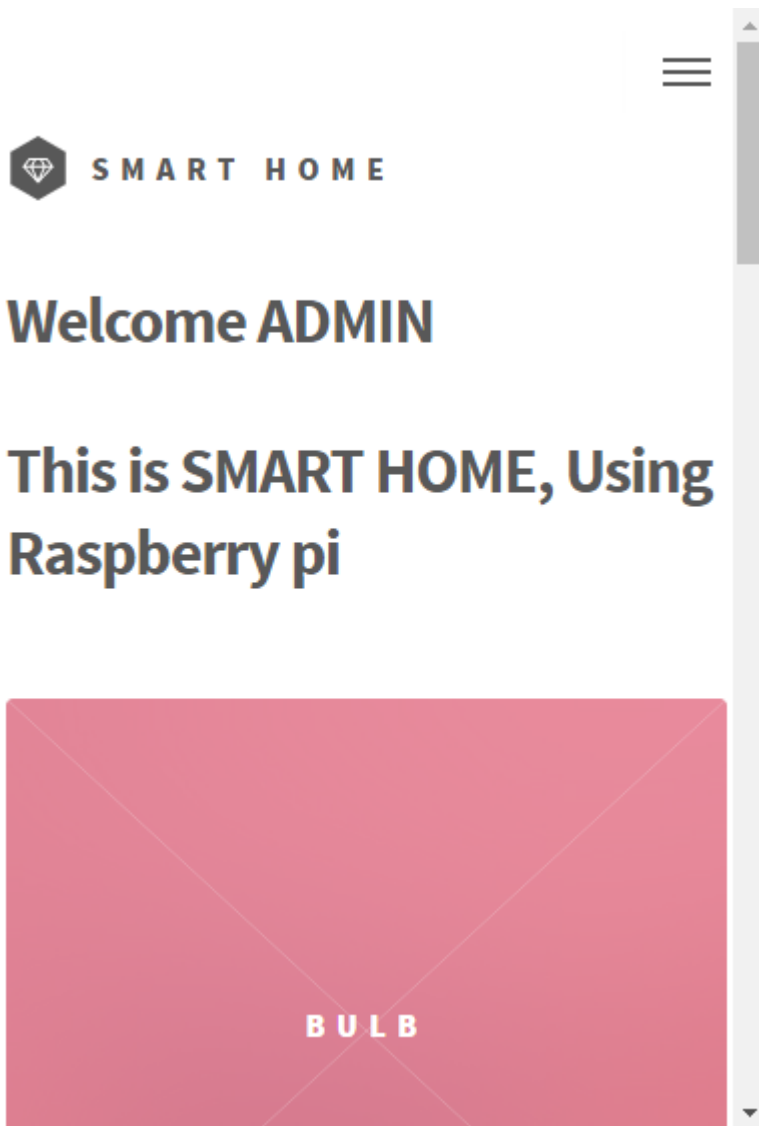
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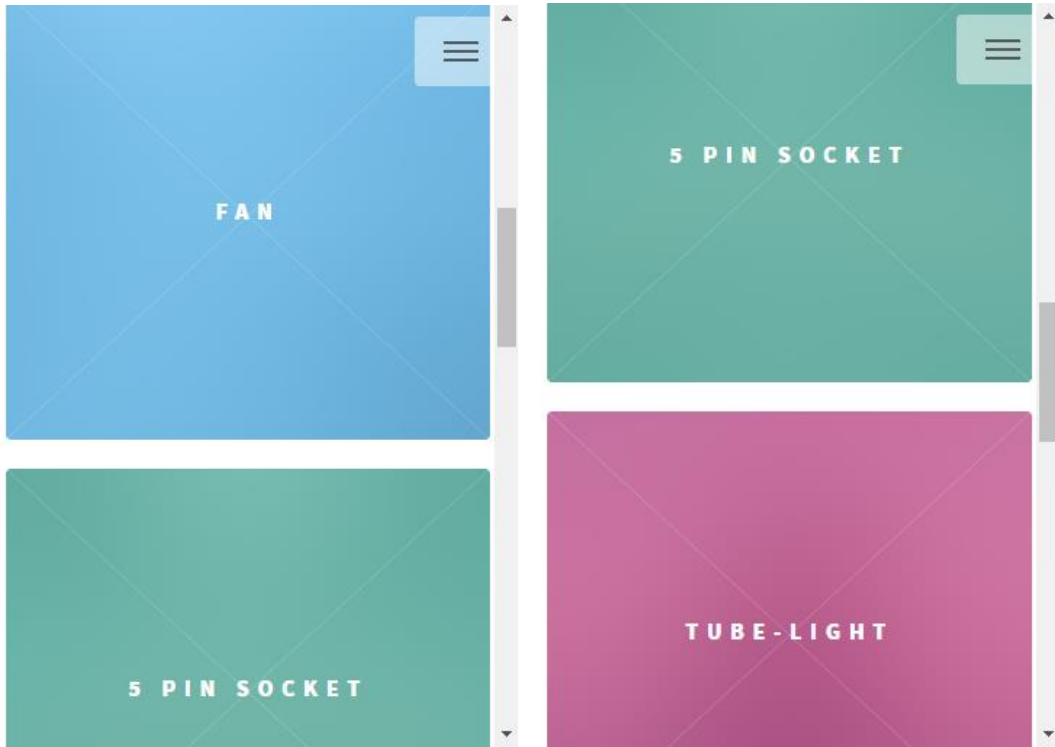
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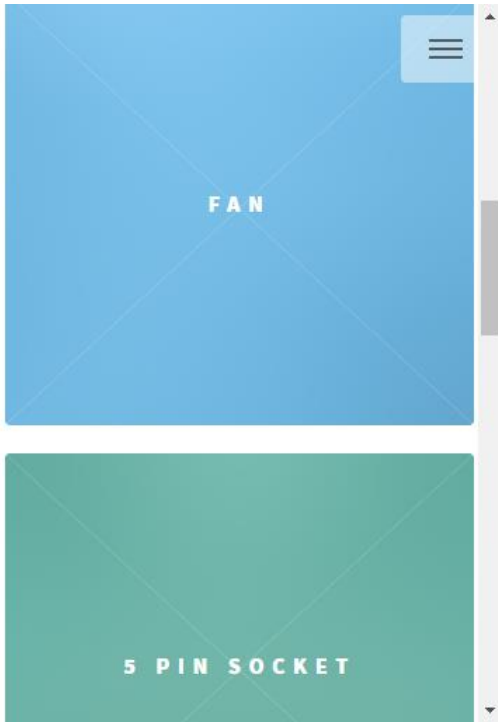
Admin index menu Bar :-



Index for Admin Mobile:-







CONTACT US

Name

Email

Message

SEND

Registrations:-



REGISTRATION

FIRST NAME:

LAST NAME:

CITY:

EMAIL:

USERNAME:

PASSWORD:

CONTACT NO:

FOR mobile:-



REGISTRATION

FIRST
NAME:

—

LAST
NAME:

—

EMAIL:

—

USERNAME:

—

PASSWORD:

—

CONTACT
NO:

—

SUBMIT



ADMIN

BULB Operations

TURN ON BULB	TURN OFF BULB
TURN ON LIGHTING	TURN OFF LIGHTING



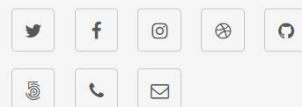
CONTACT US

Name Email

Message

SEND

FOLLOW





ADMIN

Tube-light Operations

TURN ON TUBE-LIGHT

TURN OFF TUBE-LIGHT



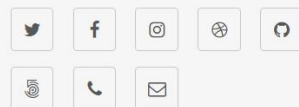
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Message

SEND

FOLLOW





SMART HOME

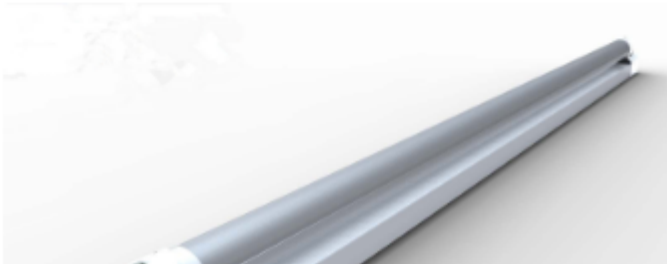


ADMIN

Tube-light Operations

TURN ON TUBE-LIGHT

TURN OFF TUBE-LIGHT





User

BULB Operations

TURN ON BULB

TURN OFF BULB

TURN ON LIGHTING

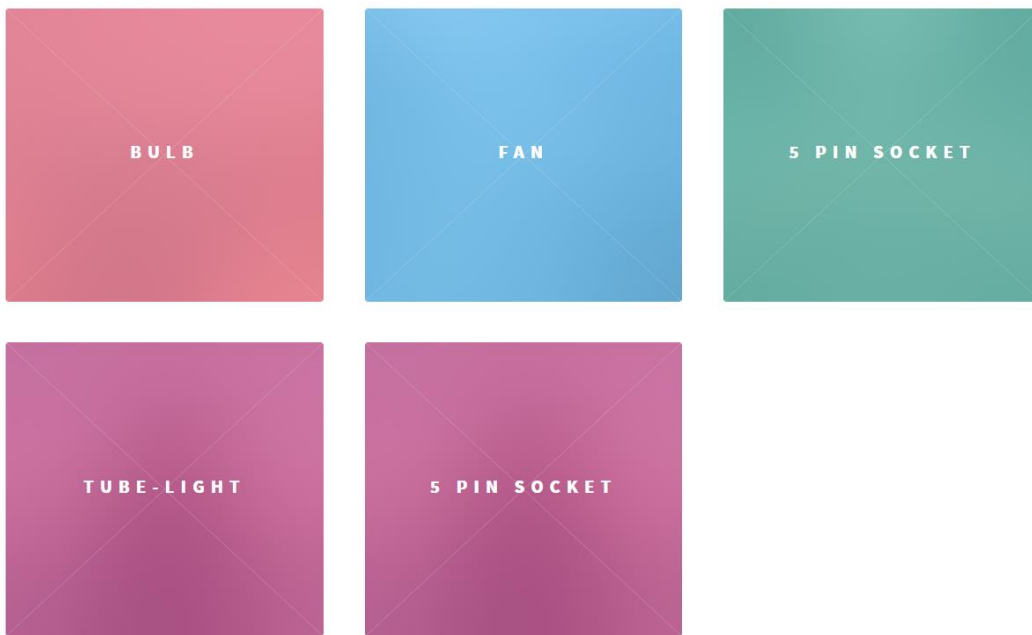
TURN OFF LIGHTING





Welcome USER

This is SMART HOME, Using Raspberry pi



CONTACT US

Name Email

Message

SEND

FOLLOW

[!\[\]\(1e1e421c5238d05c468852f9828118f6_img.jpg\)](#) [!\[\]\(9710c800283f0dc6aaccff876949a80b_img.jpg\)](#) [!\[\]\(51c617fc27599ec9752c816ca4e4451a_img.jpg\)](#) [!\[\]\(fa8b517908f0a3c1dd3ab04dec6d24b8_img.jpg\)](#) [!\[\]\(8cf8f289df185175f589c5479604c6a9_img.jpg\)](#)

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Welcome USER

This is SMART HOME, Using Raspberry pi



MENU

Home

Logout

BULB

FAN

5 PIN SOCKET

TUBE-LIGHT

5 PIN SOCKET

CONTACT US

Name

Email

Message

SEND

FOLLOW





M E N U

Home

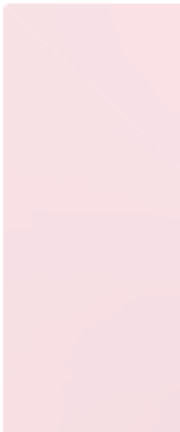
New User

Logout

Welcom

This is

Using P



Welcome ADMIN

This is SMART HOME, Using Raspberry pi



MENU

- Home
- New User
- Logout



CONTACT US

Name Email

Message

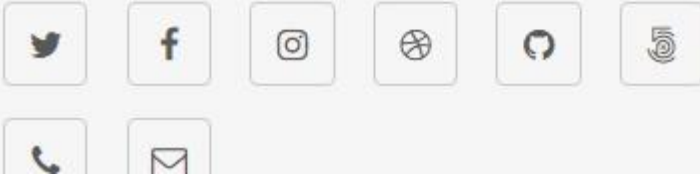
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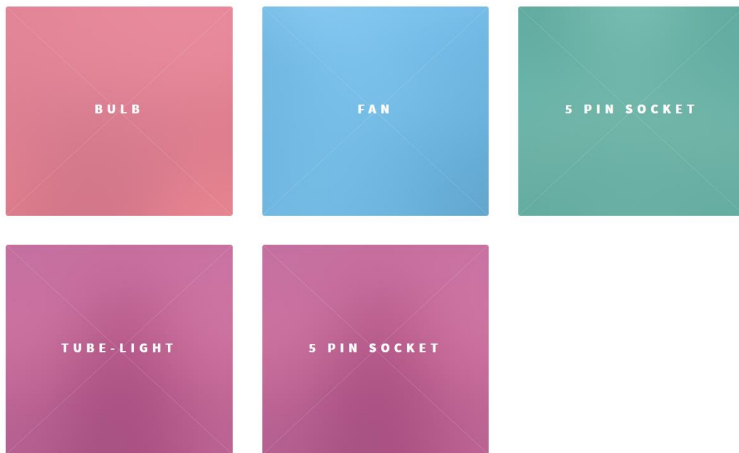
FOLLOW





Welcome USER

This is SMART HOME, Using Raspberry pi








CONTACT US




Name Email

Message

SEND

FOLLOW

Welcome USER

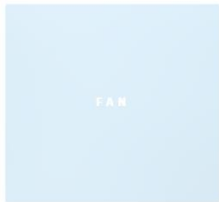
This is SMART HOME, Using Raspberry pi



M E N U

Home

Logout



CONTACT US

Name Email

Message

SEND

FOLLOW





User

BULB Operations

TURN ON BULB	TURN OFF BULB
TURN ON LIGHTING	TURN OFF LIGHTING



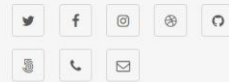
CONTACT US

Name Email

Message

SEND

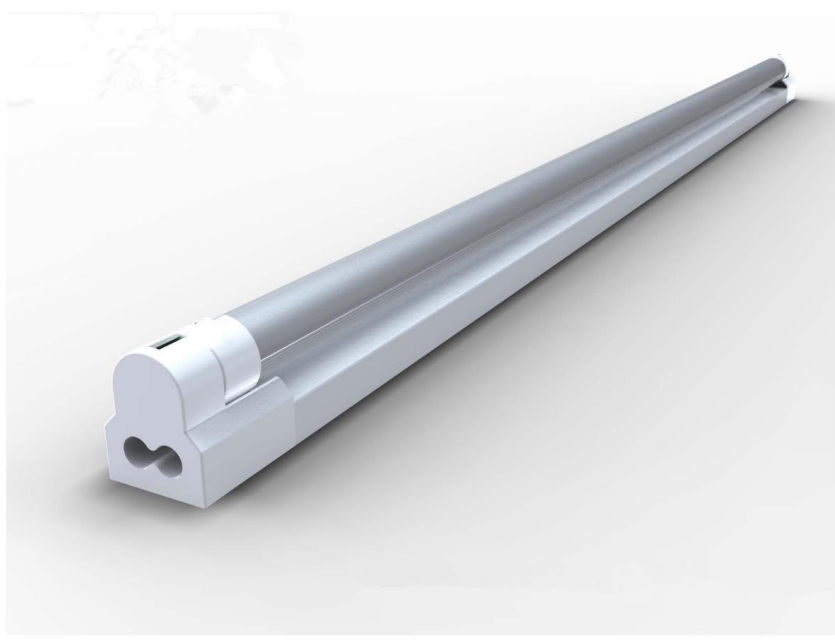
FOLLOW





User

Tube-light Operations

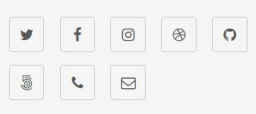


CONTACT US

Name Email

Message

FOLLOW



3.12 Data Dictionary:

FIELD	TYPE	KEY	NULL
Admin_id	Int	Primary key	NO
Admin_name	Varchar		NO
Admin_age	Int		NO
Admin_contact	Int		NO
Admin_email	Varchar		NO
Admin_username	Varhhar		NO
Admin_password	Varchar		NO
User_id	Int	Primary Key	NO
User_name	Varchar		NO
User_age	Int		NO
User_contact	Int		NO
User_email	Varchar		NO
User_username	Varchar		NO
User_password	Varchar		NO

3.14 Table Specification :

TABLE ADMIN			
FIELD	TYPE	KEY	NULL
Admin_id	Int	Primary key	NO
Admin_name	Varchar		NO
Admin_age	Int		NO
Admin_contact	Int		NO
Admin_email	Varchar		NO
Admin_username	Varhhar		NO
Admin_password	Varchar		NO

TABLE USER			
FIELD	TYPE	KEY	NULL
User_id	Int	Primary key	NO
User_name	Varchar		NO
User_age	Int		NO
User_contact	Int		NO
User_email	Varchar		NO
User_username	Varhhar		NO
User_password	Varchar		NO

3.14 Test Procedures :

The development process involves various types of testing. Each test types address a specific testing requirement. The most common types of testing involved in the development process are:-

- a) Unit testing.
- b) System Testing.

Testing presents an interesting anomaly for the software engineer. The engineer creates a series of test cases that are intended to ‘demolish’ the software that has been built. In fact, testing is the one step in the software engineering process that could be viewed as destructive rather than constructive (through actually this is also a constructive step).

All testing activities were carried out keeping in mind the following things:

- All tests should be traceable to customer requirements.
- Test should be planned before testing commences
- Initially testing should begin in small and gradually it should grow in shape.
- Testing is not done by the developpe

Test Case:1

MODULE NAME: Login Form

OBJECTIVE: To check whether the data entered is correct.

Case Id	Field to be tested	Entered Value	Actual Value	Result	Comment
TC-1	User Name	Blank	Alpha Numeric	Pass	Please Enter User Name
TC-2	User Name	Numeric Value	Alpha Numeric	Pass	Please Enter Valid User Name
TC-3	Password	Blank	Alpha Numeric	Pass	Please Enter Password
TC-4	Username And Password	Wrong	Alpha Numeric	Pass	Please Enter Valid User Name And Password
TC-5	Username And Password	Correct	Alpha Numeric	Pass	Login Successfully

Test Case-:2

MODULE NAME: Registration Form

OBJECTIVE: To check whether the data entered is correct.

Case Id	Field to be tested	Entered Value	Actual Value	Result	Comment
TC-1	Company Name	Blank	Text	Pass	Please Enter Company Name..
TC-2	Company Name	Numeric Value	Alpha Numeric Value	Pass	Please enter valid Company Name
TC-3	Email ID	Blank	Alpha Numeric Value	Pass	Please enter Email ID.
TC-4	Email ID	Invalid	Alpha Numeric Value	Pass	Please enter Correct Email ID.
TC-5	Email ID	Valid	Alpha Numeric Value.	Pass	Valid Email ID.
TC-6	Contact Number	Blank	Number	Pass	Please enter Contact Number.
TC-7	Contact	Invalid	Number	Pass	Please enter

	Number	Contact Number			valid Contact Number.
TC-8	Contact Number	Valid Contact Number	Number	Pass	Correct Contact Number.
TC-9	UserName	Invalid UserName	Alpha Numeric Value.	Pass	Please enter valid UserName.
TC-10	UserName	Valid UserName	Alpha Numeric Value.	Pass	Valid UserName.
TC-11	Password	Blank	Alpha Numeric Value.	Pass	Please enter Password.
TC-12	Password	Invalid	Alpha Numeric Value.	Pass	Please enter Correct Password.
TC-13	Password	Valid	Alpha Numeric Value.	Pass	Correct Password.
TC-14	Confirm Password	Invalid	Alpha Numeric Value.	Pass	Enter valid Password.
TC-15	Confirm Password	Valid	Alpha Numeric Value.	Pass	Correct Password.

CHAPTER 4: USER MANUAL

4.1 User Manual:

The system has 2 users:

- User
- Admin

Login Page:

The page with 2 options will be displayed to users.

- Admin
- Student

The users must choose their role accordingly.

- ADMIN
 - Admin can login with his credential
 - If forgot password he can recover
- USER
 - User can login with his credential provided by Admin
 - If forgot password he can recover
 - User can't register by himself he have to send his details to admin

HOME Page:

- ADMIN
 - Admin can register user with his credential
 - Admin can manage the circuit
 - He can turn on and turn off the lights
 - He can setup lighting
 - He can control speed of fan
 - He can turn on and turn off fan
 - If he want can control power switch
 - Admin manage user details
- USER
 - User can manage the circuit
 - He can turn on and turn off the lights
 - He can setup lighting
 - He can control speed of fan
 - He can turn on and turn off fan
 - If he want can control power switch

User Manuals Screen 1 :



LOGIN

USERNAME:

PASSWORD:

SUBMIT

Screen2:



REGISTRATION

FIRST NAME:

LAST NAME:

CITY:

EMAIL:

USERNAME:

PASSWORD:

CONTACT NO:

SUBMIT

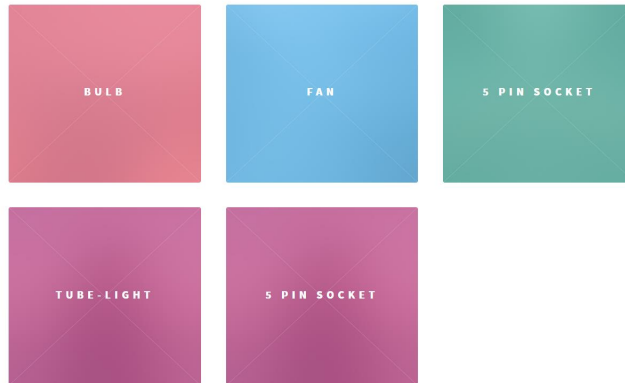
Screen 3:



 SMART HOME

Welcome ADMIN

This is SMART HOME, Using Raspberry pi



CONTACT US

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Screen4:

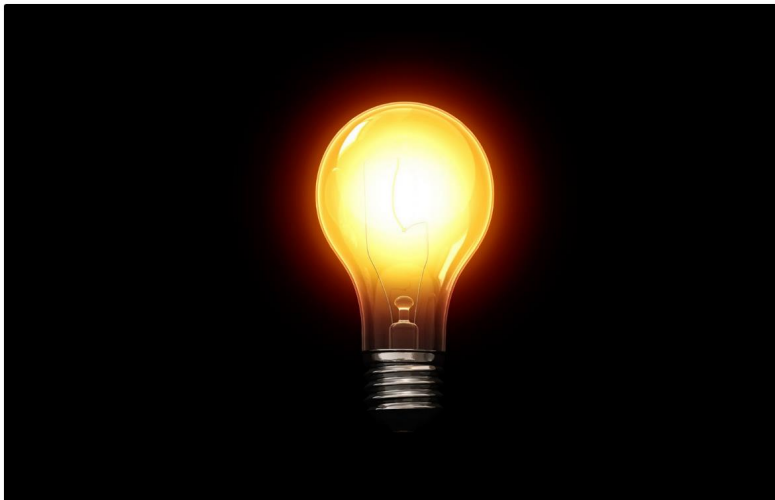


 SMART HOME

ADMIN

BULB Operations

TURN ON BULB	TURN OFF BULB
TURN ON LIGHTING	TURN OFF LIGHTING



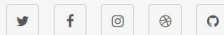
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4.2 Menu Explanation :

Homepage:

On the homepage users can see three options:

- Light
- Fan
- Power supply

Admin:

On the Admin page, admin can see four options:

- Light
- Fan
- Power supply
- Create & manage user

Whenever admin can login he can control the electronic circuit with his hand if he want to use mobile app he can control using web application here admin also manage user credential. He can create user and provide him login & password

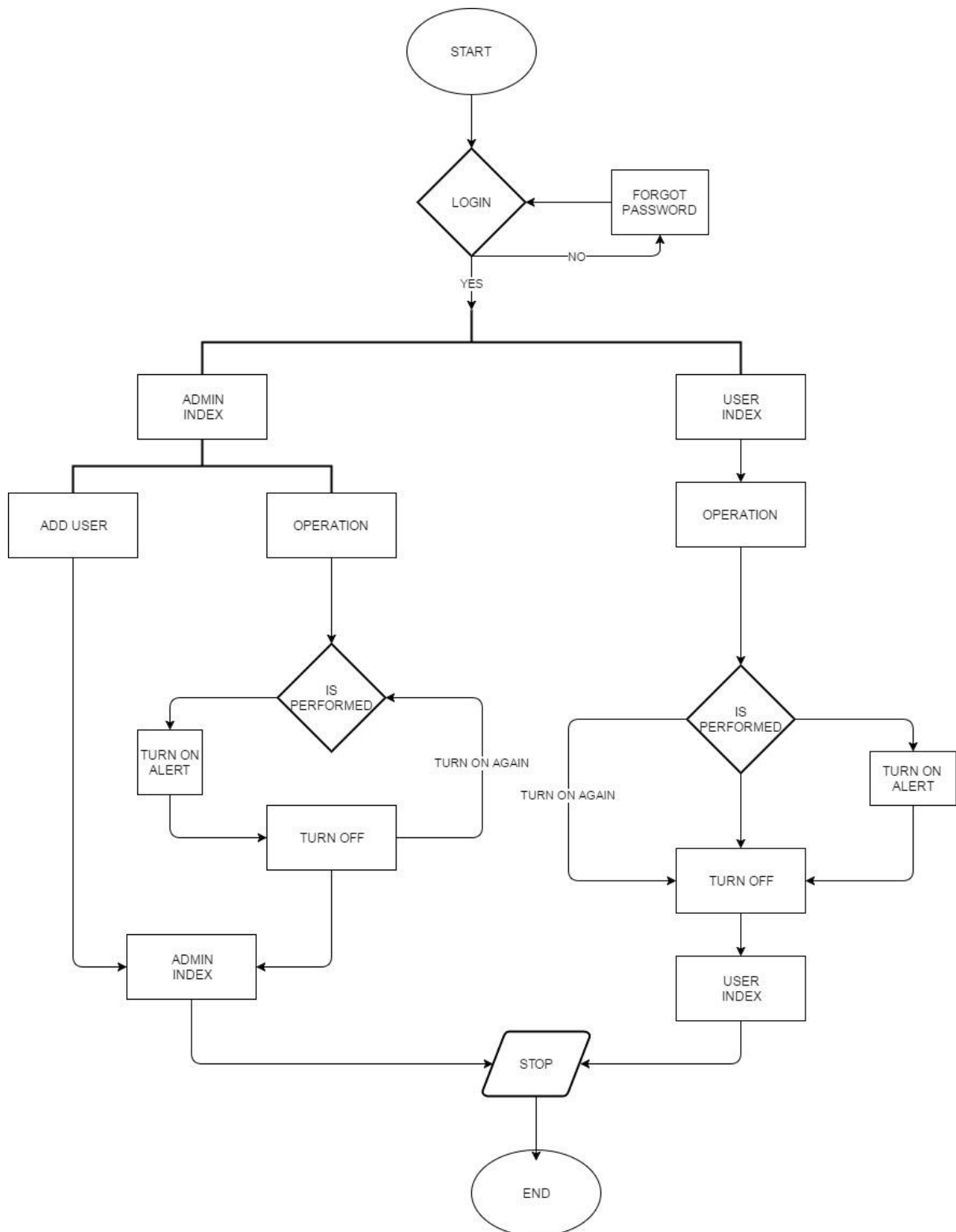
Whenever user can login he can control the electronic circuit with his hand using clicking on the web application and manage the circuit.

He can turn on and turn off lights in the house.

He can turn on and turn off fan in the house.

He can control the speed of the fan.

4.3 Flow chart :



DRAWBACKS AND LIMITATIONS

DRAWBACKS :

1. Supposed power supply goes off raspberry pi can't control that
2. There is possibility that if our system is working on router then it can get hacked

LIMITATIONS :

1. We can't fully automate our home because if something goes wrong then it can damaged
2. We can't force User to adopt this changed
3. Deploying home automation to fully managed could be tough job

PROPOSED ENHANCEMENTS

Deploy this project using Angular 2 and Node js IOT speed up the process.

Host this project on cloud platform such as AWS to improve user experience

Mash up of multiple technological things into single frameworks. Most of the application domain need minimum processing power micro-controller, design required micro-controller.

Connecting to the social media through IoT based email system.

CONCLUSION

Almost all industries and market sector is impacting by Internet of Things. More industries are involving to full requirements of IoT. Craze of IoT is increasing in market place, most of companies making the hardware (microcontroller) for IoT. And some industries started making their IoT enabled devices. The topmost ranker industries already in market with their IoT cloud platform. The 2020 can be expected, where IoT can be completely used in real-time life in every sector

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