Wifi Based Home Automation System

The TAT Coders

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Introduction

The Introduction of Virtual Labs has been of a huge advantage to students and professionals for learning through “Hands-on”.

In this project we introduce the in-depth knowledge of “Wi-Fi Based Home Automation using IoT”.

Beginning of the “Smart Homes”, resulting in:

- Increased Security
- Improvement in Medical Outcomes
- Easy Lifestyle
- Optimised use of Energy Consumption
- Reduction in Cost

In 2021, 28 billion smart devices will be connected to each other and soon hundreds of billions of devices will be connected

Soon smart home will be able to anticipate our every need.
It will transform our business our lives and our world in a way we never imagined.

This project is nothing but a stepping stone towards living that life.

Objectives

Our Wifi Based Home Automation system will work on the following objectives

- Low Cost System
- More Secure System
- Remotely Accessible System
- Auto-Configurable System
- Wi-Fi Technology Capable Solution
- Flexibility
- Scalability
- Available Online on Virtual Labs For Free Access for a Better Understanding.
- “Hands-on” and in-depth knowledge of Home Automation for students and professionals.

Data Resources Used

Programming Languages Used For Simulation

- HTML (HyperText Markup Language)
- CSS (Cascading Style Sheets)
- JavaScript

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Module Requirements for Real Working Project

- Arduino Board
- Wi-Fi Module
- Relay
- Cables
- Android Mobile Application

Methodology

- Our proposed home automation system consists of a web server,wifi technology and ,hardware interface modules which will be connected with the sensors and actuators which in turn, will be responsible for the working of the appliances.

- At center, we have a web server (i.e. PC or a mobile device) connected to the internet with appropriate web browser support .

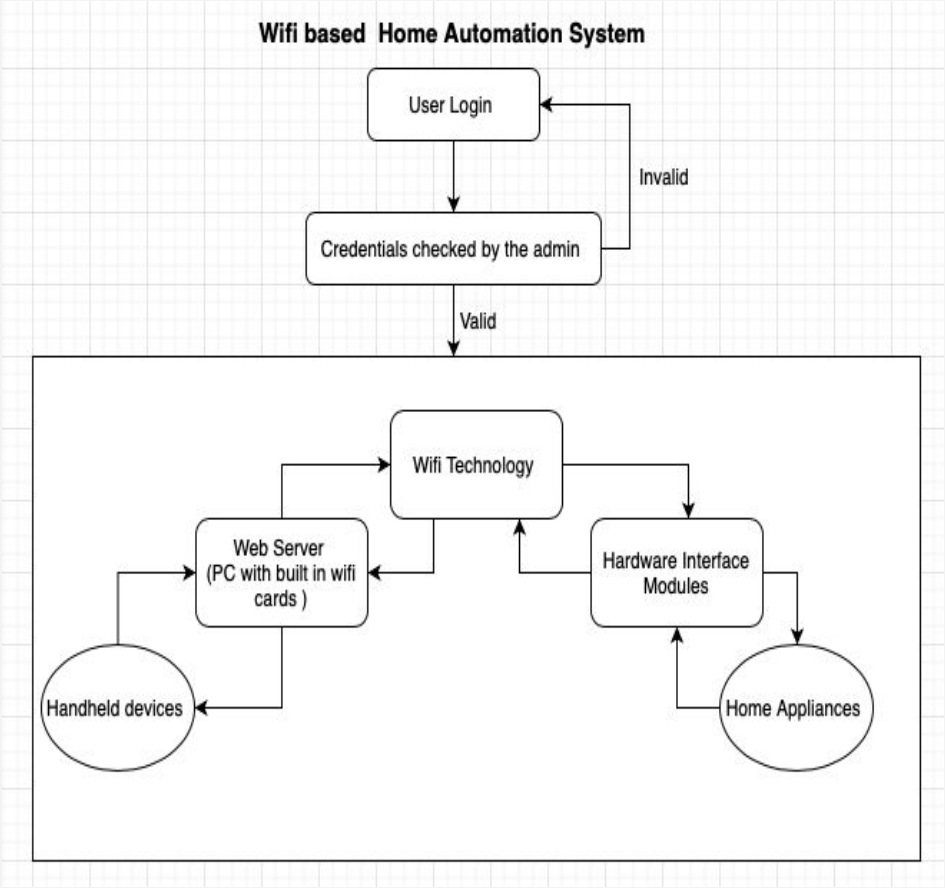
- The WiFi Technology will act as an interconnection between Hardware Modules and Web Server.

- The hardware interface modules will be directly connected to the sensor and actuators through wired connection.

- Server works in two ways:
  - It manage the hardware interface modules about when to execute their tasks thorough actuator, and
  - It report back to the server through sensors.

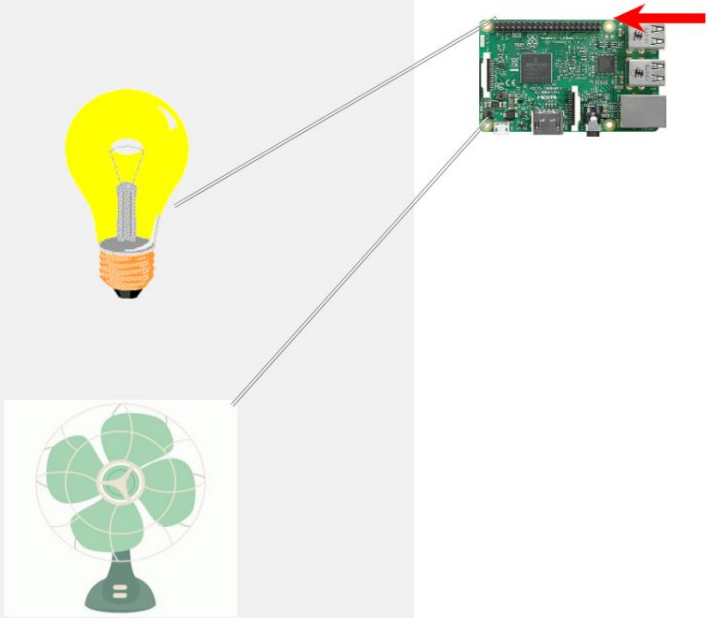
- The Admin plays an important role:
  - Looks after the whole system,
  - Checks the valid and invalid credentials at the front-end for the user to access the system.

System Layout



Simulation

Applications



Work Flow

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Workflow of the Simulation

Simulation Output

Our Simulation shows two appliances connected to the same hardware interface module

Once the user sends a request to access the appliances the data is transferred over a secured wifi connection to the hardware interface modules and then implemented through a cable connection.

We can also check the working of the appliances in the simulation

- If the user tries to access the lights the process mentioned above is followed and the light turns on .
- Similarly, if the user tries to access the fan the process mentioned above is followed and the wings of the fan starts rotating.

Conclusion

So our project proposes a low cost , secured, remotely accessible configurable Home Automation System

The objectives discussed earlier were targeted one by one and we were successful in building a simulation based on wifi technology satisfying user needs and requirements.

WiFi technology has proved to be an effective solution to built a remotely accessible system which is secure and has helped in reducing the costs then the previously existing systems.

We were also able to implement it in the real life where we were able to control light using a wifi based system.

The proposed system is also better in the form of flexibility and scalability then the existing systems.

Hence we can conclude that the required goals and objectives of our wifi based home automation system have been achieved.

Acknowledgement

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Image of Home Automation System By: https://static.vecteezy.com/system/resources/previews/000/474/456/non_2x/vector-smart-home-design-concept.jpg

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Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/

Thank You