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IOT BASED HOME AUTOMATION SYSTEM USING RASPBERRY PI

Nataraja P R,
Assistant professor, Electronics and Communication Department, SAIT, VTU, Bengaluru, India
Rahul S, Sachin S, Shashank Gowda N.H, Tejas D
UG Student, Electronics and Communication Department, SAIT, VTU, Bengaluru, India

ABSTRACT
Internet of things is a technology of the future that has already started to touch our homes. Here we propose an IOT based home automation system using raspberry pi that automates home appliances and allows user to control them easily through internet from anywhere over the world.
Our proposed system consists of a microcontroller-based circuit that has lights and fan connected to it along with LCD display and Wifi connector interfaced with raspberry pi. Our system interacts with out online IOT system that IOT Gecko free web interface for controlling our home appliances with ease. After linking with IOT Gecko, the user is allowed to send load switching commands over IOT to our circuit.
The circuit receives the commands over IOT by connecting to internet using WIFI connector and then the raspberry processor processes these commands. After this the processor now processes these instructions to get user commands. It then displays these on an LCD display. Also, it operates the loads (lights and fan) for switch them on/off according to desired user commands. Thus, we automate home appliances over internet using raspberry pi**.**

Keywords:
Raspberry Pi, LCD display, home appliances, WIFI connector

INTRODUCTION
IoT-Based Automation with Raspberry Pi and Node MCU In our fast-paced world, convenience and efficiency are key. Imagine a home where lights adjust to your presence, appliances respond to your switching command, and energy usage is optimized automatically. Welcome to the future of living, made possible through IoT-based home automation. By harnessing the power of Raspberry Pi and Node MCU we're taking control to the next level With Raspberry Pi serving as the brain of the operation, and Node MCU acting as the limbs, our system seamlessly integrates sensors, actuators, and smart devices to create a cohesive ecosystem. From controlling lights and thermostats to monitoring security cameras and managing energy consumption, the possibilities are endless, join us on a journey as we delve into the intricacies of IoT-based home automation using Raspberry Pi and Node MCU.

OBJECTIVES
Remote Access and Control: Enable users to remotely access and control various home appliances and devices through a user-friendly interface, such as a mobile app or web interface. Sensor Integration: Integrate sensors (e.g., temperature, humidity, motion) to gather data about the home environment and use this data to automate tasks or provide insights to users. Energy Efficiency: Implement features to optimize energy usage, such as scheduling appliances to turn on/off at specific times or adjusting settings based on occupancy and environmental conditions. Security and Monitoring: Incorporate security measures to protect the system from unauthorized access and provide monitoring capabilities, such as detecting intrusions or unusual activities. Scalability and Modularity: Design the system to be scalable and modular, allowing for easy addition of new devices or functionalities in the future.

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LITERATURE SURVEY

Smart Energy Efficient Home Automation System using IOT - 2007 - This paper presents a step-by-step procedure of a smart home automation controller. It uses IOT to convert home appliances to smart and intelligent devices, with the help of design control.IOT Based Smart Security and Home Automation-2008- This paper focuses on a system that provides features of Home Automation relying on IOT to operate easily, in addition to that it includes.A Dynamic Distributed Energy Management Algorithm of Home Sensor Network for Home Automation System-2021- This paper proposes an optimization of home power consumption based on PLC (Power Line Communication) for an easy to access home energy.Enhance Smart Home Automation System based on Internet of Things-2022- This paper proposes a system that develops a model to reduce the computation overhead in existing smart home solutions that uses various encryption technologies like AES, ECHD, hybrid, etc.
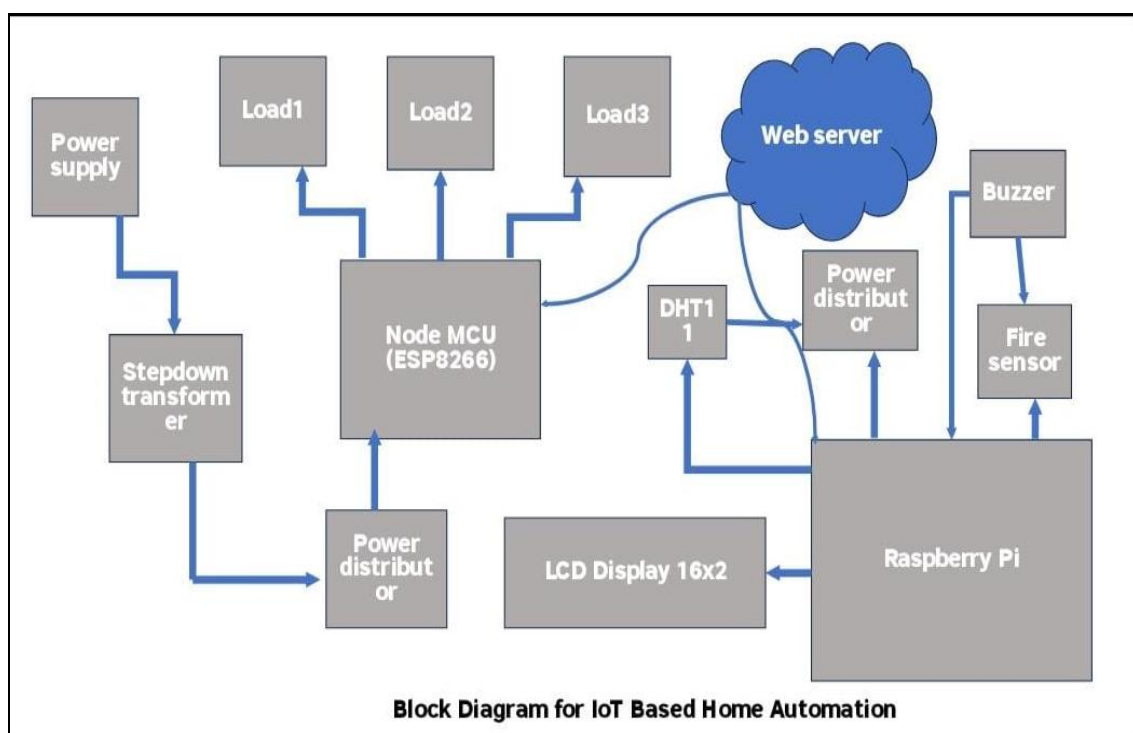
Figure 1 Block diagram of Proposed System

COMPONENTS USED

- Step down Transformer
- Power Distributer
- Node MCU(ESP8266)
- Relays
- Loads
- Bulb
- DC fan
- Raspberry Pi 3
- DHT11
- Fire Sensors (RobodoSEN16)
- Piezo Buzzer
- LCD Display 16x2
- Arduino IDE
- Raspberian

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CONCLUSION

The Raspberry Pi serves as the central processing unit, managing the communication between different components of the system. It runs the necessary software to coordinate the actions of connected devices and processes data received from sensors, And it displays the DHT values in the LCD Display and also sense the fire flames using fire sensors. The Node MCU, on the other hand, acts as a microcontroller unit responsible for Controlling the switches using cloud Adafruit.

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