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IOT ENABLED HOME APPLIANCES CONTROL SYSTEM

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ABSTRACT

This paper presents a design and prototype implementation of new industrial or home automation system that uses GPRS\Wi-Fi technology as a network infrastructure connecting its parts. The proposed system is better from the scalability and flexibility point of view than the commercially available home automation systems. In Industry we have different types of loads at different locations. We can control all loads at a time from one place (control room) without connecting any physical wire between loads and control room, In this project we are using GPRS\WI-FI module, Microcontroller and Relay. Here , In this project , GPRS\wifi is connected to the phone and the loads are operated with it, once the GPRS\wifi is connected.

INTRODUCTION

The recent developments in technology which permit the use of wireless controlling environments like, Bluetooth and Wi-Fi that have enabled different devices to have capabilities of connecting with each other. Using a WIFI shield to act as a Micro web server for the Arduino which eliminates the need for wired connections between the Arduino board and computer which reduces cost and enables it to work as a standalone device. The Wi-Fishield needs connection to the internet from a wireless router or wireless hotspot and this would act as the gateway for the Arduino to communicate with the internet. With this in mind, an internet based home automation system for remote control and observing the status of home appliances is designed.

Due to the advancement of wireless technology, there are several different type of connections are introduced such as GSM, WIFI, and BT. Each of the connection has their own unique specifications and applications. Among the four popular wireless connections that often implemented in HAS project, WIFI is being chosen with its suitable capability. The capabilities of WIFI are more than enough to be implemented in the design. Also, most of the current

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laptop/notebook or Smartphone come with built-in WIFI adapter. It will indirectly reduce the costof this system.

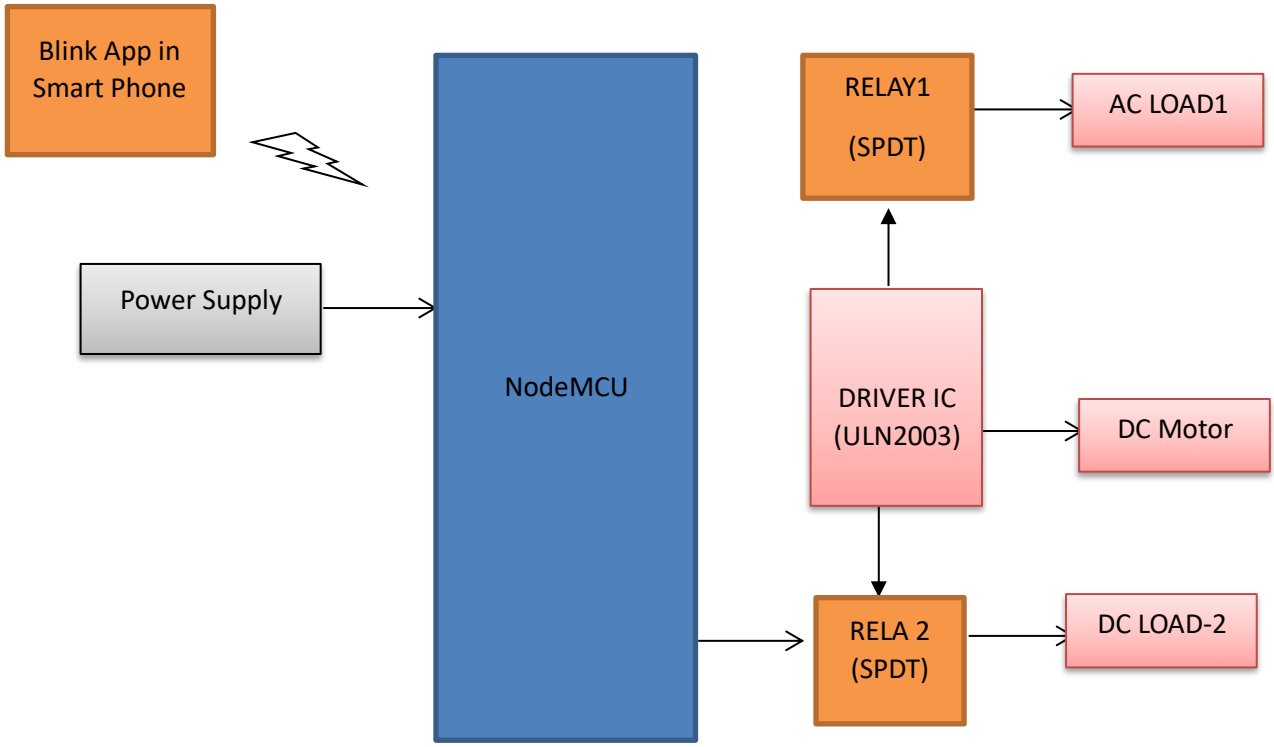

Figure.1 Block Diagram

LITERATURE SURVEY

1.“Smart Energy Efficient Home Automation System using IOT”, by Satyendra K. Vishwakarma, Prashant Upadhyaya, Babita Kumari, Arun Kumar Mishra.

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. An energyefficient system is designed that accesses the smart home remotely using IOT connectivity. The proposed system mainly requires, Node MCU as the microcontroller unit, IFTTT to interpret voice commands, Adafruit a library that supports MQTT acts as an MQTT broker and Arduino IDE to code the microcontroller. This multimodal system uses Google Assistant along with a web based application to control the smart home. The smart home is implemented with main controller unit that is connected with the 24-hour available Wi-Fi network. To ensure, that the Wi-Fi connection donot turn off, the main controller is programmed to establish automatic connection with the available network and connected to the auto power backup.

2. "IOT Based Smart Security and Home Automation", by Shardha Somani, Parikshit Solunke, ShaunakOke, Parth Medhi, Prof. P. P. Laturkar.

This paper focuses on a system that provides features of Home Automation relying on IOT to operateeasily, in addition to that it includes a camera module and provides home security. The android application basically converts Smartphone into a remote for all home appliances. Security is achieved with motion sensors if movement is sensed at the entrance of the house; a notification is sent that contains a photo of house entrance in real time. This notification will be received by the owner of thehouse via internet such that app can trigger a notification. So owner can raise an alarm in case of anyintrusion or he/she can toggle the appliances like opening the door if the person is a guest. The system uses Raspberry Pi, a small sized computer which acts as server for the system. The smart home consist two modules. Home automation that consists; fan light and door controller, and security module that consists; smoke sensor motion sensor and camera module.

3. "A Dynamic Distributed Energy Management Algorithm of Home Sensor Network for Home Automation System", by Tui-Yi Yang, Chu-Sing Yang, Tien-Wen Sung.

This paper proposes an optimization of home power consumption based on PLC (Power Line Communication) for an easy to access home energy consumption. This also proposes a Zigbee and PLC based renewable energy gateway to monitor the energy generation of renewable energies. ACSand DDEM algorithm are proposed for the design of an intelligent distribution of power managementsystem to make sure ongoing power supply of home networks. To provide efficient power management the power supply models of home sensor network are classified groups viz. main supplyonly, main supply and backup battery, rechargeable battery power and non-rechargeable battery power. Devices with particular features are assigned to these groups. It targets to establish real timeprocessing scheme to address variable sensor network topologies.

4. "Enhance Smart Home Automation System based on Internet of Things", by Tushar Churasia and Prashant Kumar Jain.

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. these solutions use intermediate gateway for connecting various sensor devices. The proposed model provides a method for automation with sensor based learning. The system

uses temperature sensorfor development but other sensors can also be used as per requirement. These smart home devices with sensors can configure themselves autonomously and can operate without human intervention.This work minimizes encryption decryption and focuses on authentication and automation of smart home devices with learning. The system bypasses local gateway mentioned in existing system to provide better security for smart home devices and sensor data and save computation overhead. Thereal time broker cloud is directly connected with smart home and manages all incoming and outgoing request between users and devices. The main purpose to use real time broker cloud is save time of cryptographic operations.

5. "Visual Machine Intelligence for Home Automation", by Suraj, Ish Kool, Dharmendra Kumar, Shovan Barman.

The paper present a vision-based machine intelligence system to sense on/off state of common homeappliance. The proposed method of sensing the state of appliances results on a novel home automation system. The accessibility of the suite of devices in the home over a remote network is facilitated by the IP Addressing methods in the IOT. This project uses two boards viz. Raspberry Pi and Intel Galileo Gen 2. The communication between the User devices, Raspberry Pi and the Intel Galileo boards happens over a wireless network. The UDP protocol is deployed to facilitate the wireless communication of the nodes present in the home automation network. A Pi Cam and a USBLogitech camera attached to the rotating shaft of two different servo motor capture snapshots that are passed as inputs to the Machine Learning based models trained using dlib-C++ to detect the state of the operation of the appliances. The proposed method uses visual modality to automate the appliances, as privacy concerns may emerge while using the images from some specific places, as a counter to this issue, an SPDT switch is added to the Raspberry Pi which when turned off ensures that even if the images are taken from the webcams, they are just passed as inputs to the machine learning models and are not displayed on the website when the users access the website on the server address obtained from Raspberry Pi.

PROPOSED SYSTEM

The android OS provides the flexibility of using the open source. The inbuilt sensors can be accessedeasily. The application used to control the system has the following features. Android Phone acts as a client and data are sent via sockets programming. The application takes command from user in twodifferent modes.

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Switch mode: Switch mode uses the radio buttons that are used to control the home appliances. The radio button sends the status of the switch.

Now a days, the technology has in a grown at high speed. This paper proposes the design of IOT based home automation system using Wi-Fi. This research work presents the design and implementation of arduino based IOT based system. This is Wi-Fi based system and uses wireless technology (Wi-Fi). The system has three components: An arduino, a Wi-Fi module for signal transfer and smart phone for controlling web page server. The design is based on standalone arduino Wi-FI board and appliances are connected to this board using relays, the smart phone interact with the arduino via Wi-Fi. The aim of project is controlling the home appliances when the user is away from the place.

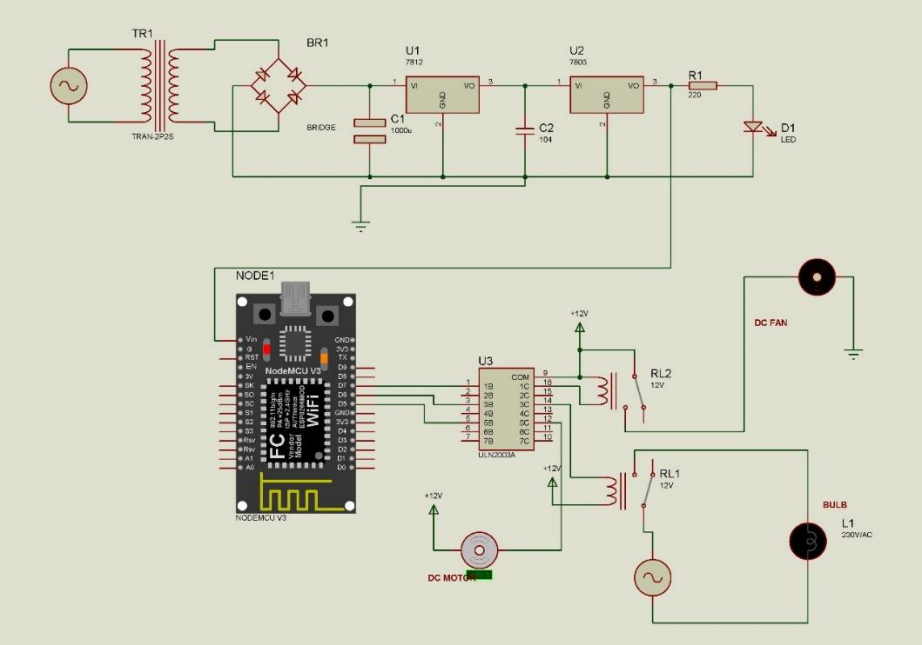

Figure.2 Schematic Diagram

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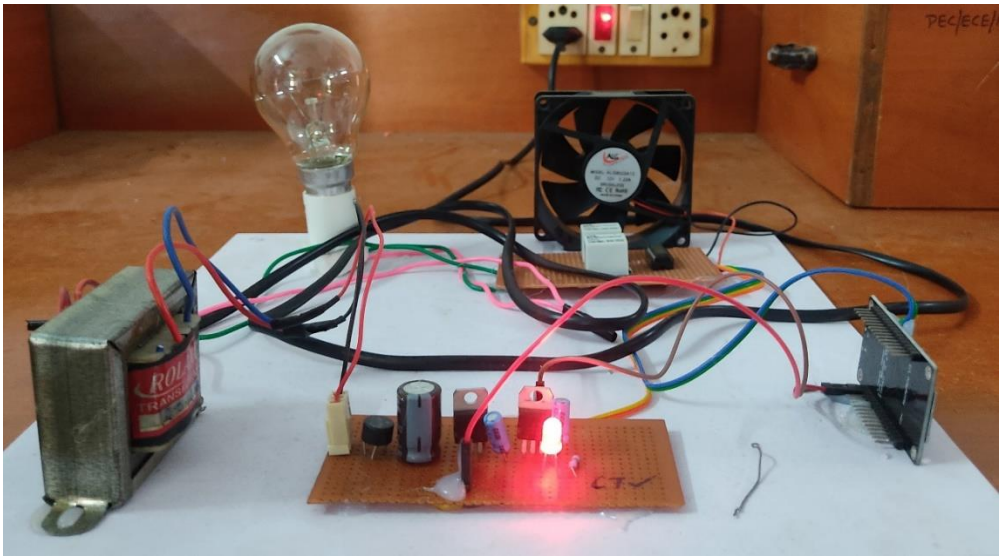

Figure.3 Working Kit

RESULTS

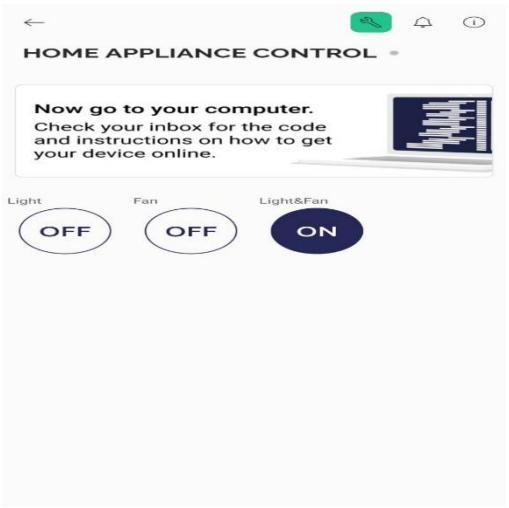

Figure.3 Status ON on Blynk

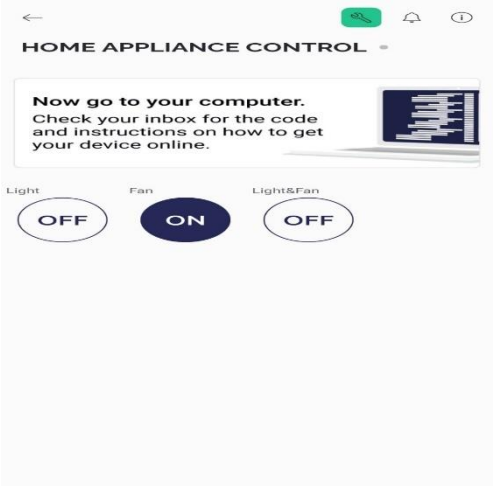

Figure.4 Status of Fan ON

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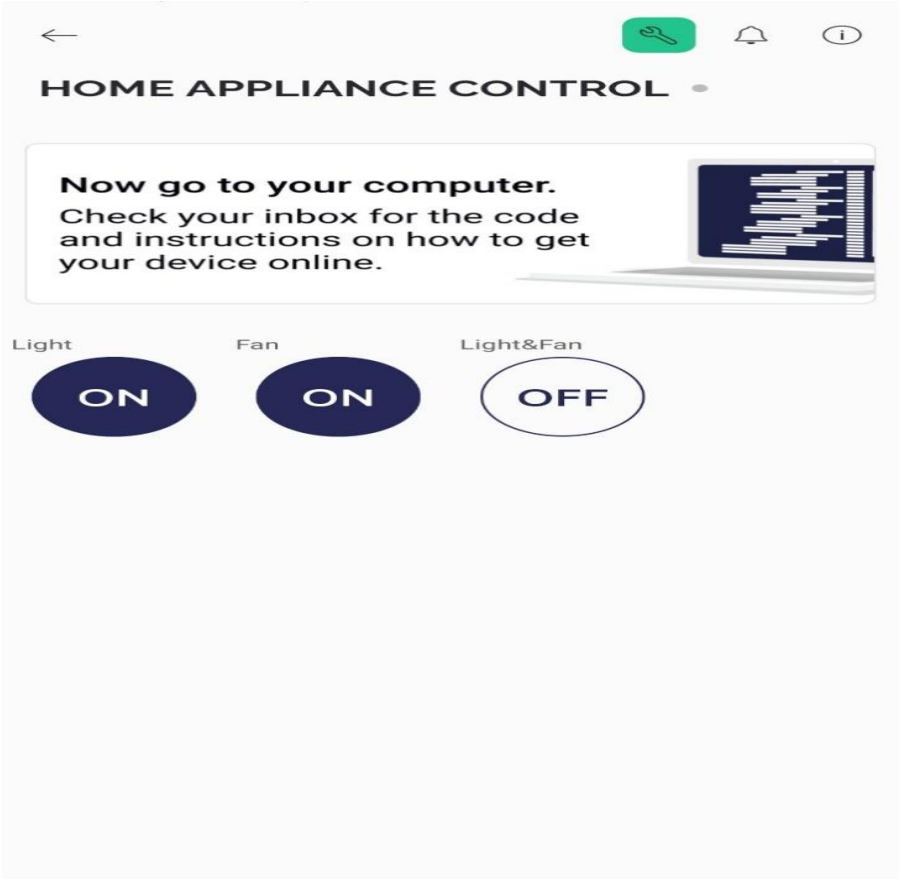

Figure.5 Status of Light & Fan ON

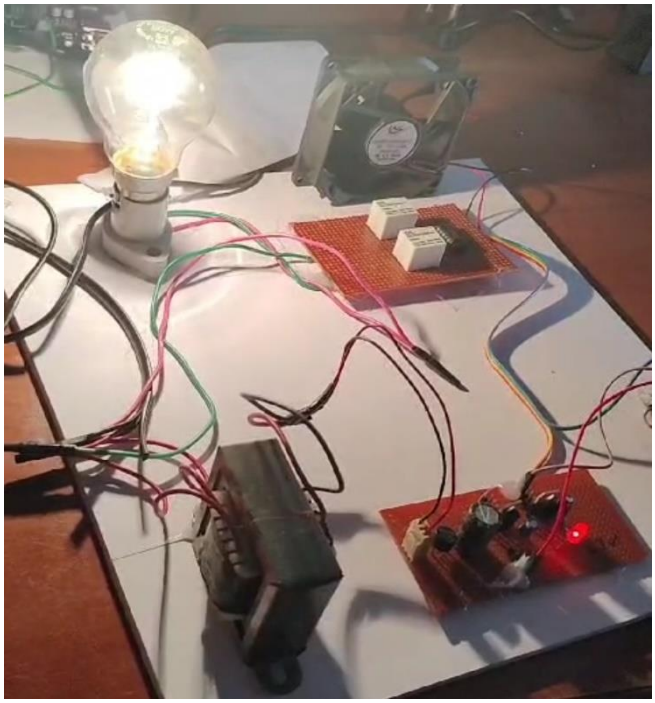

Figure.6 photocopy of Light ON

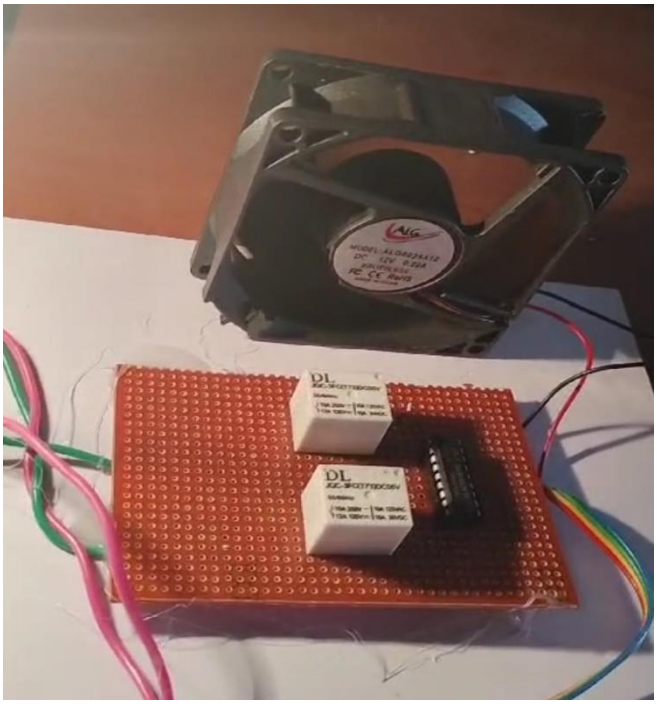

Figure.7 photocopy of Fan ON

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CONCLUSION

It is evident from this project work that an individual control home automation system can be cheaply made from low-cost locally available components and can be used to control multifarious home appliances ranging from the security lamps, the television to the air conditioning system and even the entire house lighting system. And better still, the components required are so small and few thatthey can be packaged into a small inconspicuous container. The designed home automation system was tested a number of times and certified to control different home appliances used in the lighting system, air conditioning system, home entertainment system and many more . Hence, this system isscalable and flexible.

FUTURE SCOPE

Integration and Interoperability: As IoT ecosystems continue to evolve, there will be a greater emphasis on seamless integration and interoperability among various devices and platforms. This will allow users to control different appliances from multiple manufacturers through a single interface or platform.

Smart Energy Management: IoT-enabled home appliances can play a crucial role in energy conservation and management. Future systems may incorporate advanced algorithms and AI to optimize energy usage based on real-time data, user preferences, and utility rates. This can lead to significant cost savings and a reduced carbon footprint.

Enhanced Automation and Personalization: Future systems will likely offer more advanced automation capabilities, allowing appliances to anticipate user needs and adjust settings accordingly. Personalization features may also become more sophisticated, providing tailored recommendations and experiences based on individual preferences and usage patterns.

Improved Security and Privacy Measures: With the increasing connectivity of home appliances, security and privacy will remain paramount concerns. Future systems will likely implement advanced encryption techniques, authentication protocols, and intrusion detection systems to safeguard user data and prevent unauthorized access.

Integration with Emerging Technologies: IoT-enabled home appliances will likely integrate with other emerging technologies such as augmented reality (AR), virtual reality (VR), and

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voice assistants. This integration can enhance user experiences, making it easier to interact with and control appliances through intuitive interfaces.

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