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IOT BASED HOME AUTOMATIOM SYSTEM OVER THE CLOUDS

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Abstract: Internet of Things (IoT) is a system of interrelated computing devices where all the things, including every physical object, can be connected - making those objects intelligent, programmable and capable of interacting with humans. As more and more data are generated each day, IoT and it's potential to transformhow we communicate with machines and each other can change the world. The user operates the smart home devices year in year out, have produced mass operation data, but these data have not been utilized well in the past. This project focuses on the development of home automation system based on internet of things which allows the user to automate all the devices and appliances of home and merge them to provide seamless control over every side of their home. The data can be used to predict the user's behavior custom with the development of a machine learning algorithm, and then the prediction results can be employed to enhance the intelligence of a smart home system. The designed system not only gives the sensor data but also process it according to the requirement, for example switching on the light when it gets dark and it allows the user to control the household devices from anywhere. The cloud is used to send the sensor data through Wi-Fi module and then a decision tree is implemented which decides the output of the electronic devices also, it is used to achieve the power control and local data exchanging which provide the user interface, store all the information corresponding to the specific house, and query the function information of an individual home appliance.

Keywords: Embedded c, IoT, Cloud, Google Assistant,etc.

I. INTRODUCTION

The Internet of Things is a system of related computer devices, machines and digital devices, objects, animals or people that are equipped with unique identifiers and the ability to transmit data over the network without the need for human-human or human-human interaction. It is a computational concept that describes the idea of combining physical objects of everyday use with the Internet to enable communication between things and people. IoT describes a world in which almost everything can be connected and communicate in an intelligent way. Devices can be any objects, such as smart phones, Internet televisions, sensors, electronic devices, etc. To collect and exchange data, electronics, software, sensors and network connectivity are embedded in them. With the increase in the level of sophistication in basic devices and growing concerns about environmental requirements to develop an intelligent system that is self-aware of the environment and can analyze and react at its own discretion without the need to use thehuman factor, called Automated Systems.

The proposed system focuses on the development of an online home automation system based on the Internet of Things, which allows the user to automate all devices and home appliances and connect them to ensure smooth control over each page of their home. The data can be used to predict non-standard user behavior by developing a machine learning algorithm, and then the prediction results can be used to increase the intelligence of the smart home system. Designed system not only transmits data from the sensor, but also processes them as required, for example, turns on the light when it gets dark, and allows the user to control the household appliances from anywhere. The cloud is used to send data from sensors via the Wi-Fi module, and then implements a machine learning algorithm that also determines the efficiency of electronic devices, serves to achieve power control and local data exchange that provide user interface, storage all information relating to of a specific house and asking for information about the functions of a single household appliance. To enable or disable the Google LED assistant, you can use it tosend voice commands.

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II. EXISTING SYSTEM

ZigBee is AN IEEE 802.15 customary employed in home automation technology and the same as LAN and Bluetooth technology. This technology uses frequency (RF) for sign and management. Zigbee may be a mesh protocol, wherever devices will act as repeaters. This technology offers advantage of increase within the property of devices inside the house. Zigbee technology is wireless therefore it helps to beat the intrusive installation downside. The Zigbee customary provides 250kbps rate that is comfortable for dominant home devices. The installation and running price is low. During this system the zigbee and (WLAN|wireless local area network) are integrated with the assistance of common entrance. this method uses four devices as a light-weight switch, radiator valve, and safety device and zigbee device. The system is split into 2 subsystems. First is DSM (i.e.) Digital Home Service Distribution and Management System: this provides the interface for management and observation of home devices. Second is Home gateway: this can be used for managing the house automation system. It accepts portable signals And activates or deactivates a LED for home devices. B. X10 X10 may be a versatile home automation technology that uses home's existing electrical wiring to remotely management lights, appliances, security system and far additional. The X10 commands travel from X10 transmitters to X10 receivers through customary unit wiring. This technology will use each strategies i.e. wired cable and wireless radio communication strategies. X10 is cheap and plenty of devices are obtainable. This technology provides restricted management over home devices.

III. PROPOSED SYSTEM

As of late, remote frameworks like Wi-Fi have clothed to be more and more basic in home systems administration. Likewise in home and building automation frameworks, the employment of remote advancements offers some points of interest that could not be accomplished utilizing a wired system because it were.

1) Reduced institution costs: 1st and principal, institution prices are altogether bated since no cabling is significant. Wired arrangements need cabling, wherever material and conjointly the professional egg laying of links (e.g. into dividers) is expensive.

2) System skillfulness and straightforward augmentation: Deploying an overseas system is especially worthy once, owing to new or modified conditions, growth of the system is significant. instead of wired institutions, within which cabling augmentation is repetitive. This makes remote institutions a creative venture.

3) sensuous advantages: with the exception of covering an even bigger region, this credit fulls sensuous conditions conjointly. Cases incorporate delegate structures with all-glass engineering and chronicled structures wherever define or center reasons do not allow egg laying of links.

4) Integration of cell phones: With remote systems, partner cell phones, maybe, PDAs and Smartphones with the robotization framework lands up perceptibly conceivable everywhere the place and whenever, as a convenience's correct physical space isn't once more important for AN association (as long because the gadget is in reach of the system). for each one amongst these reasons, remote innovation is not only AN appealing call in plan and renovation, nevertheless in addition for brand spanking new institutions.

The following Comparison Table shows differences between ZIGBEE technology and present innovative Technology Internet of Things (IoT) in terms of factors such as Bandwidth, power consumption, range, cost factors, and frequency etc.

Comparison Teams	ZIGBEE IOT	IOT (WIFI)
Bandwidth	250kbps	11 - 72 mbit/S
Power Consumption	550 ma	320 ma
Range	10-100m	140-250m (outdoor)
Factors	High Cost	Low Cost (Data)
Frequency	2.4ghz	5.8ghz

Table 1.A SURVEY ON IOT

The proposed system uses the ESP8266 Wi-Fi module which is connected to electronic devices. It uses a Wi-Fi network to connect it from the cloud. The Wi-Fi module sends the Humidity and Temperature data to the cloud which allows

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the user to monitor the readings. The user can change the speed of the fan and switch ON or OFF the light. Embedded C language Algorithm is used to adjust theelectronic devices according to the user behavior. Using this data, the dataset is being made to make the appliances learn according to the user's behavior. The datais connected to the ESP8266 which provides the data in a room.

Hardware Requirements:

- Microcontroller
- Arduino
- Relay
- Power Supply
- Wifi Modules

Software Requirements:

- Embedded C
- Compiler tool
- Simulation tool

Node MCU

The ESP8266 is a low-cost Wi-Fi microchip, with a full TCP/IP tack and microcontroller ability, created by Espressif Systems in Shanghai, China. The ESP8285 is an ESP8266 with 1 MiB of inherent glimmer, permitting the structure of single-chip gadgets equipped forinterfacing withWi-Fi.These microcontrollerchips have been prevailing by the ESP32group of gadgets, including the pin-viable ESP32-C3

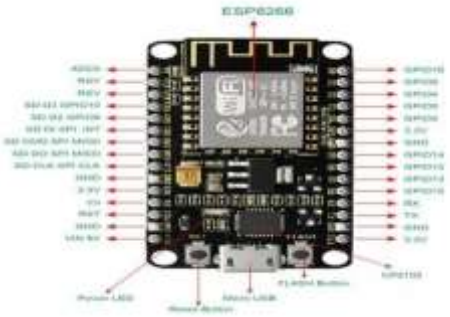

Fig 1: Block diagram of Node MCU

System Design and Implementation

A. Proposed Home Automation System

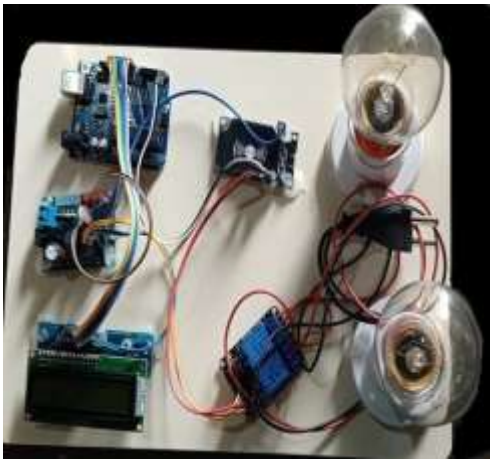

Fig 2: Proposed model diagram

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B. Projected Home Automation System Functions

The projected home robotization framework has the capacities to regulate the related to elements in shoppers homeand screen the related to cautions:

- Temperature and viscosity
- Motion recognition
- Fire and smoke recognition
- Light level

The projected home mechanization framework will management the related to machine:

- Lights on/off/diminish
- Fan on/off
- On/off numerous machine
- Components needed

C.Wi-Fi :

Wi-Fi (Wireless Fidelity) may be a wireless networking technology used for exchanging the knowledge between 2 ora lot of devices while not mistreatment cables or wires. There square measure numerous Wi-Fi technologies like Wi- Fi 802.11a, 802.11b, 802.11g and 802.11n. Here, during this project Wi-Fi module is employed to receive commandsfrom the net and activate hundreds through by execution a program written at intervals the Wi-Fi module. Hence, no microcontroller is employed during this project to drive hundreds

D. ARDUINO

Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL),[1] permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits

Smart Home

Fig 3: Smart Home

A model home is worked for the house robotization framework and is as appeared within the figure above. At the approach of the house a movement device is settled to spot any development on the brink of the approach. Light-weight one can activate consequently once light-weight device distinguishes the haziness. A cooler/Fan can activate once the space temperature surpasses the set edge and thus decreases the space temperature. The gas device MQ-6 is place within the room to differentiate any gas spillage, if any spillage is known the alert within the lobby is raised.
Hand-off is employed to modify the electrical machines like light-weight, fan so forth. The Intel uranologist is related to wireless fidelity card with the reception apparatuses for the network with internet.

Implemenation of Steps:

Step 1: To establish connection between the client and the server, the Wi-Fi option in the Smartphone isenabled.

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Step 2: It is connected to the Wi-Fi module of the system.
Step 3: Each electronic/electrical appliance in the system is connected to the digital pins on the Wi-Fi Module. **Step 4:** A Relay is used for connecting each device to the Node MCU, which helps in converting high Voltagesupply to low voltage.
Step 5: A C-program is loaded on to the microprocessor chip on the Node MCU which specifies what action isto be performed on receiving inputs.
Step 6: A Cloud Interface is developed which enables the end user to monitor and control the appliances from any remote location.
Step 7: Socket Programming has been used to achieve client-server communication.
Step 8: Successful controlling and monitoring of appliances.

IV. RESULT

The cloud is used to send the sensor data through Wi-Fi module and then a decision tree is implemented which decides theoutput of the electronic devices also in output

Fig 4. Output diagram

It is used to achieve the power control and local data exchanging which provide the user interface, store all the information corresponding to the specific house, and query the function information of an individual home appliance

V. CONCLUSION

The project in general has been successfully implemented. The software produced for the project is functionally correct,reasonably robust, and usable. The project has met the entire General and Non-Functional Requirements and in addition, has been implemented in a modular fashion, which can be easily modified or rewritten at a later stage. The user interface is easy to use and works in all web browsers. It does not require any propriety interfaces or plug-ins to operate. This means that the Home Automation System is accessible from any web browser and that the system could be usable from anywhere on the Internet and therefore from anywhere on the planet. The software is robust. The design of the software means that most errors are caught in a non- fatal manner, meaning that the software can continue executing even after a bad request.

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