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A Review on Home Automation using ESP8266 Development board

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ABSTRACT

With advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. Wireless Home Automation system(WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection.[2]

Keywords: esp8266 dev board, relay module, Router.

I. INTRODUCTION

Now a days because of modern technology Home Automation System has become very useful for handicapped people. It is very useful to the user to control and handle all the appliances that are connected to the system, from a controlling device. “Easy use of appliances” is main motive of this system. In this system home appliances can be controlled, and the user can interact with the system through a user friendly interface. The home appliances like fans, lights, switches are remotely controlled through a main control board. By using of the Internet of Things (loT), the developing of home automation has become simpler and more popular. Internet of Things (IoT) is nothing but connecting different real world objects to provide proper communication, synchronization, and inter-connection between various devices or physical appliances also known as "Things".

In this system home appliances can be controlled locally and globally through a website from anywhere in the world using Internet. This system is scalable that can add any appliances and it is also secured by password.[1]

II. APPLICATION OF IoT

1. Medical & healthcare systems

IoT devices could be used to enable remote health monitoring & emergency notification systems. These health monitoring devices could range from blood pressure & heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fit bit electronic wristbands or advanced hearing aids.

The use of automation techniques to evaluate the larynx and vocal tract helps the speech specialists to perform accurate diagnosis[6].Specialized sensors could also be equipped within living spaces to monitor health & general well-being of senior citizens, while also ensuring that proper treatment is being administered & assisting people regain lost mobility via therapy as well. Other consumer devices to encourage healthy living, such as, connected scales or wearable heart monitors, are also a possibility with IoT. More & more end-to-end health monitoring IoT platforms are coming up for antenatal & chronic patients, helping one manage health vitals & recurring medication requirements.

2. Building & home automation

IoT devices could be used to monitor & control mechanical, electrical & electronic systems used in various types of buildings (e.g., public & private, industrial, institutions, or residential) in home automation & building automation systems.

3. Transportation

The IoT could assist in integration of communications, control, & information processing across various transportation systems. Application of IoT extends to all aspects of transportation systems (i.e. vehicle, infrastructure, & driver or user). Dynamic interaction between these components of a transport system enables inter & intra vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistic & fleet management, vehicle control, & safety & road assistance.

4. Large scale deployments

There are several planned or ongoing large-scale deployments of IoT, to enable better management of cities & systems. For example, Songdo, South Korea, first of its kind fully equipped & wired smart city, is near completion. Nearly everything in this city is planned to be wired, connected & turned into a constant stream of data that would be monitored & analysed by an array of computers with little, or no human intervention. Another application is a currently undergoing project in Santander, Spain. For this deployment, two approaches have been adopted. This city of 180,000 inhabitants, has already seen 18,000 city application downloads for their smart phones. This application is connected to 10,000 sensors that enable services like parking search, environmental monitoring, digital city agenda among others. City context information is used in this deployment so as to benefit merchants through a spark deals mechanism based on city behavior that aims at maximizing impact of each notification.

With wireless network in place, NY Waterway is able to take control of its fleet & passengers in a way that was not previously possible. New applications could include security, energy & fleet management, digital signage, public Wi-Fi, paperless ticketing & others .

5. Unique addressability of things

The original idea of Auto-ID Center is based on

RFID-tags & unique identification through Electronic Product Code however this has evolved into objects having an IP address or URI.

An alternative view, from world of Semantic Web focuses instead on making all things (not just those electronic, smart, or RFID-enabled) addressable by existing naming protocols, such as URI. The objects themselves do not converse, but they may now be referred to by other agents, such as powerful centralized servers acting for their human owners.

The next generation of Internet applications using Internet Protocol Version 6 (IPv6) would be able to communicate with devices attached to virtually all human-made objects because of extremely large address space of IPv6 protocol. This system would therefore be able to scale to large numbers of objects envisaged.

A combination of these ideas could be found in current GS1/EPCglobal EPC Information Services (EPCIS) specifications. This system is being used to identify objects in industries ranging from aerospace to fast moving consumer products & transportation logistics.[3]

III. BLOCK DIAGRAM

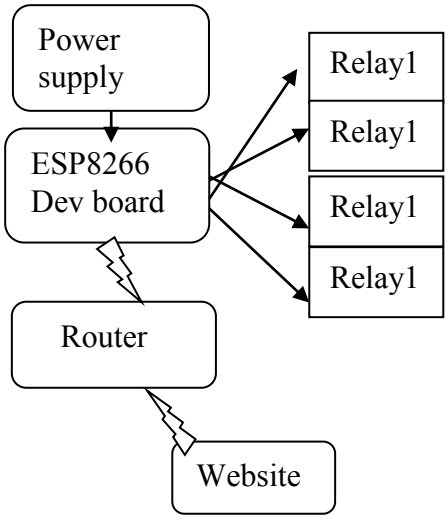

Figure 1. Home Automation system

The proposed model of the home automation system is as shown in the fig.1 above this model consist of power supply, esp8266 dev board, relay module, and modem.

in this model esp8266 offers a complete and self-contained Wi-Fi networking solutions; it can be used to host the application , when esp8266 hosts the application, it boots up directly from an external flash. It has integrated cache to improve the performance of the systems in such application.
Alternatively, serving as a WIFI adapter, wireless internet access can be added to any microcontroller based design with simple connectivity (SPI/SDIO or I2C/UART interface).

Besides the WIFI functinalities.ESP8266 is often integrated with external sensors and other application specific devices through its GPIOs.
Some features of esp8266

- 802.11b\g\h
- integrated low power 32bit MCU
- integrated TCP\IP protocol stack
- integrated 10bit ADC
- WIFI 2.4GHz,support WPA\WPA2[4].

Here esp8266 dev board is controlled by a basic website which is designed using PHP and HTML. This website consists of two pages.

IV. CONCLUSION

In some cases there may be handicapped people in house and they are not able to move frequently for controlling appliances in house, so using home automation system these people can easily control all the appliances. For handicapped people it is quite fruitful to develop home automation system which requires less and easy

user interaction.

Home automation system also improves the standard of living and provides easy, flexible and interactive user interface. To provide all functionalities in low cost and flexible environment we need to apply modern technology and devices.

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