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Home Automation System using IoT

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ABSTRACT

The theme of this home automation project using IOT is to create a smarter, more efficient, and more secure home .Time is a very valuable thing. Everybody wants to save time. In this Project We are using Different types of Sensors and Arduino Board I.R. Sensor, LDR sensor, Parking Motor etc. This project will focus on using IOT technology to automate various aspects of the home, such as lighting, Auto Open Close Parking Gate, security, and many more. The goal is to create a home that is more comfortable, efficient, and secure, while also reducing energy costs.

Keywords— Arduino , I.R. sensor, Auto Parking System etc.

I. INTRODUCTION

This study aims to develop an smart home automation system Home automation is constructing automation for a domestic, mentioned as a sensible home or smart house. In the IoT home automation ecosystem, you can control your devices like light, fan, TV, etc. A domestic automation system can monitor and/or manage home attributes adore lighting, climate, enjoyment systems, and appliances. It is very helpful to control your home devices. It's going to in addition incorporates domestic security such as access management and alarm systems. Once it coupled with the internet, domestic gadgets are a very important constituent of the Internet of Things. A domestic automation system usually connects controlled devices to a central hub or gateway. The program for control of the system makes use of both wall-mounted terminals, tablet or desktop computers, a smartphone application, or an online interface that may even be approachable off-site through the Internet. Smart Home automation refers to the use of technology to control and automate various functions in a home, such as lighting, heating, air conditioning, and security. In the context of IoT(Internet of Things) and M2M (Machine-to-Machine) communications, home automation systems can be controlled and monitored remotely through a network connection.

One of the key benefits of IoT-enabled home automation is the ability to control and monitor a wide range of devices and systems from a single, centralized location, such as a smartphone or tablet. This can include everything from lighting and temperature control to security cameras and alarm systems. Another advantage of IoT-enabled home automation is the ability to remotely monitor and control devices, even when away from home. This can be useful for controlling energy consumption and ensuring the safety and security of the home.

II. LITERATURE REVIEW

Home Automation System have become increasingly popular as the demand for efficient smart home Facilities. The purpose of this literature survey is to explore the features, benefits, and drawbacks of home automation system[1].

A. Features of Home Automation System :

Home automation allows you to control entertainment, lighting, electrical appliances, etc. remotely, to help you add efficiency to your schedule. Your system will shut off lights at night, so you don't have to worry about wasting energy. You can automate your system and program it to follow your preferred routines. [2].

B. Benefits of Home Automation System:

Many people invest in home automation technology for peace of mind. If you can't remember whether you closed the garage after you left, you can verify remotely with an app. Or, you can set up geofence automations so that the garage door closes, all exterior doors lock, and lights turn on or off once your phone, security system key fob, or vehicle tracker is a certain distance away. Here's another great example: if you're worried about frozen pipes this winter, temperature and water leak sensors can notify you when that's a risk. Until then, you get to rest easy.Plus, smart baby monitors and remote caregiving hubs like Alexa Together let you check on your loved ones—from a sleeping newborn to an aging parent. Even fur-babies benefit from home automation thanks to pet cameras—some of which dispense treats as part of a home automation routine. [2].

C. Drawbacks of Home Automation System:

One of the main drawbacks of home automation is the cost. Smart devices and systems can be expensive, and the cost can add up quickly if you want to fully automate your home. Reliance on Technology: Home automation also means that you are relying on technology to control various aspects of your home.[2].

III. PROBLEM STATEMENT

The problem statement of the home automation system is the need for efficient home facilities and Security in today's fast-paced world. One of the biggest disadvantages of building automation systems is that many systems go without regular service. This eventually leads to larger problems and increased costs. Most issues develop over time, and a qualified service technician can help prevent them through regular maintenance. The IoT based model should provide the essential functionality needed for home automation, including smart parking, smart door bell, and other services, as well as allowing users to moniterate the system over the world . The solution to this problem is an embedded based home automation system to moniter the all appliances which are present in the smart home [3][4].

IV. TECHNOLOGIES USED

The Home Automation System Model will be developed using the following technologies:

- Embedded C
- Arduino Software

Overview of technologies used:

A. Embedded C

Embedded C is generally used to develop microcontroller-based applications. C is a high-level programming language. Embedded C is just the extension variant of the C language. This programming language is hardware independent *[5].*

B. Arduino Software

Arduino IDE is the software is used to create a home automation system by using arduino Nano. The Arduino Nano is a microcontroller-based device with 16 digital pins that can be used for various purposes. It can be used for almost every task, from minor to massive industrial-scale projects. It can also be used for prototyping and developing new applications.

V. E-R DIAGRAM

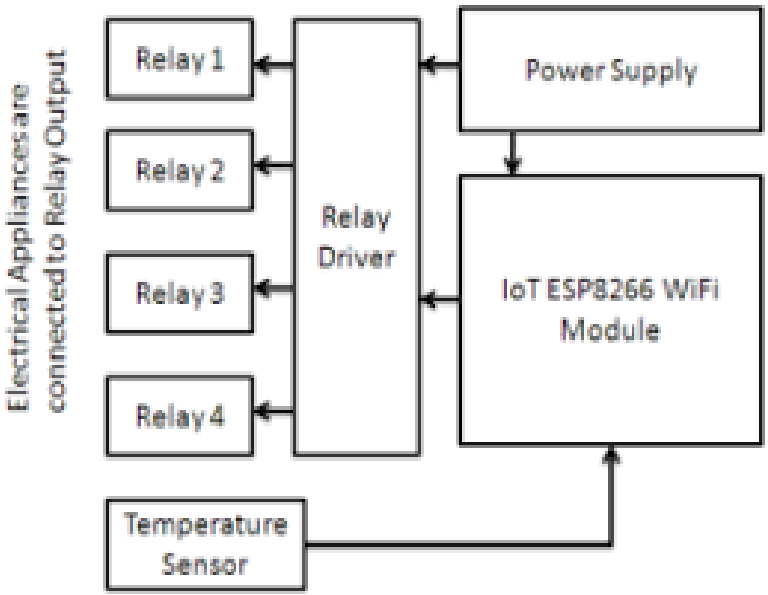

Fig. 1. **E-R Diagram**

VI. RESULT AND OUTCOME

The working of Home Automation System consists of the following steps:

1) **Smart Parking :** First, the user needs to enter in the home with their vehicle then he can used smart parking.
2) **Smart Door Bell :** After put hand infront of door bell sensor the door will be ranged.
3) **Smart Door (Open & Close):** Once the door opened then the user enter in the room and door illbe closed automatically.
4) **Staircase:** When then User entering in the room , if he goes to the upstairs then by stepping every stair there will be lights are on.
5) **LED Panel :** The LED Panel are used to watch the TV in your smart room.
6) **Garden Lights :** Once the sunsets the lights in the garden are blinked with the help of IR Sensors.

VII. FUTURE SCOPE

A. Home Automation is creating new automation technologies for houses that will make them smart using internet-based technologies. These homes/houses that use home automation technologies are smart Homes.

B. This field of home automation is fastly emerging in technology making homes safer and better places to live. These features help users to virtually monitor and control home attributes like lights, entertainment systems, security, climate control, etc.

C. Smart devices are so common and popular devices that are becoming integral parts of our lives.

D. Devices like smart Homes (Google *home, Amazon Echo, Apple home pod*) and smart assistants make it easy to control smart devices installed at homes connected via IoT.

E. The System will provide the better performance home appliances.

VIII. CONCLUSION

The home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through internet.
Main purpose of home automation system is to provide ease to people to control different home appliances with the help of the android application present in their mobile phones and to save electricity, time and money.
The Arduino is connected to the Bluetooth module, all the appliances can be controlled using the Arduino but it needs to be within a small distance for it to connect to the Bluetooth. Disadvantage: Since Bluetooth module is used, the range at which the home appliances can be controlled is reduced.

IX. REFERENCES

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