Experimental Results of Home Automation and Bidirectional Visitor Counter

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Abstract—**This Project "HOME AUTOMATION WITH BIDIRECTIONAL VISITOR COUNTER using Arduino" is a reliable circuit that takes over the task of controlling the room light and fan as well as counting number of persons/visitors in the room very accurately. When somebody enters into the room then the counter is incremented by one and the light & fan in the room will be switched ON. When any one leaves the room then the counter is decremented by one. The light & fan will be only switched OFF until all the persons in the room go out. The total number of persons inside the room is also displayed on the LCD displays. We also add the Bluetooth module in this project. With the help of this system you can control your home appliances from your mobile phone. You can turn on/off your home appliances within the range of Bluetooth.**

I. INTRODUCTION

Electricity is one of the most important resources in this century. We should conserve the electricity. But many times, we come outside the room and forget to turn off the lights/fan, thus the electricity is wasted. To overcome this, we are going to implement a project called "Home Automation with bidirectional visitor counter". This project has 2 modules. First module is "Bidirectional Visitor counter" and the other module is "Automatic room light controller". Main concept behind this project is to measure and display the number of persons entering in any room like home, seminar hall, conference room. And when number of persons inside the room is zero, power supply inside the room can be cut using a relay interface. This will help to save electricity. LCD display placed outside the room displays number of persons inside the room. Also, if at all one wants to know the number of people present in room so as not to have congestion, this circuit proves to be helpful.

Fig.1. Home Automation and Bidirectional Visitor Counter

II. SIMULATION OF THE PROPOSED HOME AUTOMATION AND BIDIRECTIONAL VISITOR COUNTER

According to the proposed system, we have designed the system structure shown in the block diagram. We have designed the model in such a way that it can be kept at a safe place inside the house. All programming and components installation are done and tested inside the laboratory and in home. There are a lot of components and wires that we have used for the system. This is done in the easiest and lowest cost possible. However, the system is flexible and can be customized by the user. This project is divided into two parts: hardware implementation and software implementation.
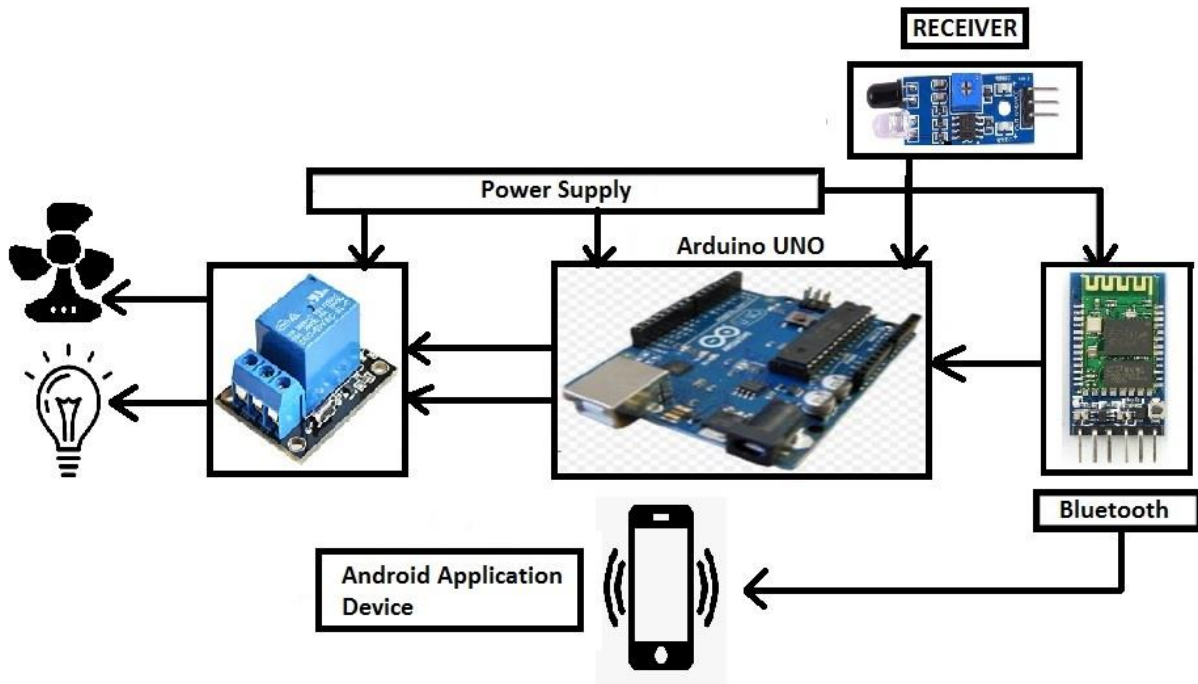
BLOCK DIAGRAM

Fig.2. Block Diagram of Home Automation and Bidirectional Visitor Counter

III. SYSTEM DEVELOPMENT AND TESTING

The main and important microcontroller board is used to design the home automation system is Arduino Uno. The Arduino board has 14 digit I/O pins. From these pins, 6 pins are used as PWM outputs. The other pins involve 16 MHz quartz crystal, USB connection, power jack, ICSP header and reset button. The IR Sensor is used here as this sensor detects persons enter an exit. The switch which is used here is relay module. It is operated electrically. In this project, a liquid-crystal display (LCD) is used. Which will show the number of persons enter and exit the room. When one person will enter in the room, IR sensor will read it and counter incremented by one and Arduino send the command to relay module to ON the light and fan and the LCD display will show the entered person number. It will work the opposite for go out from the room. We used a Bluetooth module to control light and fan from any Android phone.
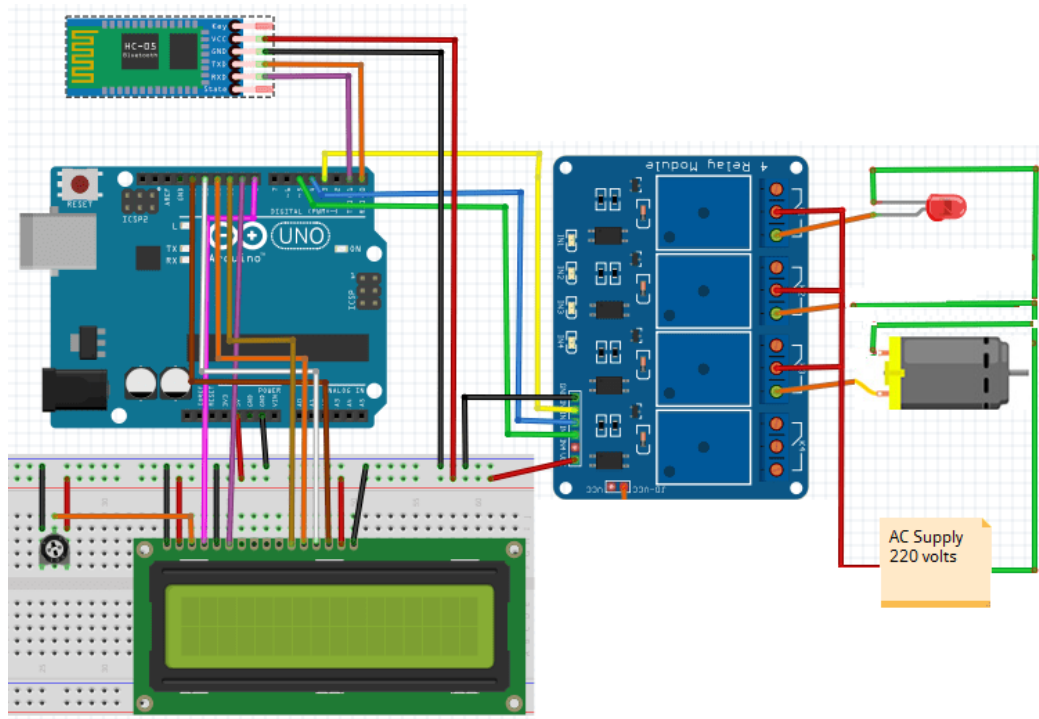
Fig.3. Circuit Diagram of Home Automation and Bidirectional Visitor Counter

IV. RESULTS AND DISCUSSIONS

We built an IoT based system which can automatically switch ON room lights and fan when at least one person is present in the room. From the room if one thinks he or she don't need light or fan, he or she can ON/OFF by using mobile apps which is connected to this project through the Bluetooth module. If room is empty, the lights and fan will automatically get switch off. It also displays count of persons present in the room. We build this system using Arduino, Bluetooth, Relay and IR sensor module.

V. CONCLUSION

It is known to all that technology is updating day by day. In the 21st century, humans always try to reduce human labour as zero yet with effective output. This work on the development of a model with "Home Automation" is one example of it. Here, with zero human effort the whole house can be controlled and it is also totally safe and secure. Future of this kind of work is too bright. Here, the home appliances are controlled automatically by the using of Arduino UNO, Relay Module, IR sensor etc. This can be done with the help Bluetooth module. One can control with his/ her house through the mobile phone.

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