

Intelligent Office Automation using Arduino

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Abstract: This system is designed to assist and provide support in order to fulfill the needs of employee in office. Automation of the surrounding environment of human being allows decreasing his work. This paper presents a low cost and flexible office control and environmental monitoring system. There has been a significant development in the area of an individual's routine tasks and those can be automated. In the present times, we can find most of the people clinging to their smart phones and smart devices throughout the day. These devices can be controlled through a Bluetooth Android based Smart phone Bluetooth interfaced Arduino which controls a number of appliances like lights, fans, bulbs and many more using on/off relay. This paper presents the automatic approach of controlling the devices in a office that could ease the tasks of using the traditional method of the switch. The most using and low cost technology for short range communication- Bluetooth is used here to automate the system.

Keywords: Home automation, Smart home, home appliances, Bluetooth, Arduino, Android

I. INTRODUCTION

There has been a best development in the area of an individual's routine tasks and those can be automated. In the present times, we can find most of the people clinging to their smart phones and smart devices throughout the day. Hence with the help of this project a mobile phone, some household or office tasks can be accomplished by personifying the use of the mobile phone. Analyzing the current smart phone market, novice Smartphone users are opting for Android based phones. It has become a second name for Smartphone in layman terms. This project presents the automated approach of controlling the devices in a office that could ease the tasks of using the traditional method of the switch.

The most famous and efficient technology for low cost but short range communication- Bluetooth is used here to automate the system. The HAS system for users is a step towards the ease of the tasks by controlling different appliances in any home or office environment.

The Automation lowers the human judgment to the lowest degree possible but does not completely eliminate it. The concept of remote management of office devices over the Bluetooth from anywhere today can be a reality. Assume a system where from the office desk, the user could turn on the cooling system, say the air conditioner, and switches on or off some of the lights.

II. Proposed System

The proposed system will have following features:

1. Arduino
2. Devices controlled through android app,
3. Mobile control
4. Bluetooth

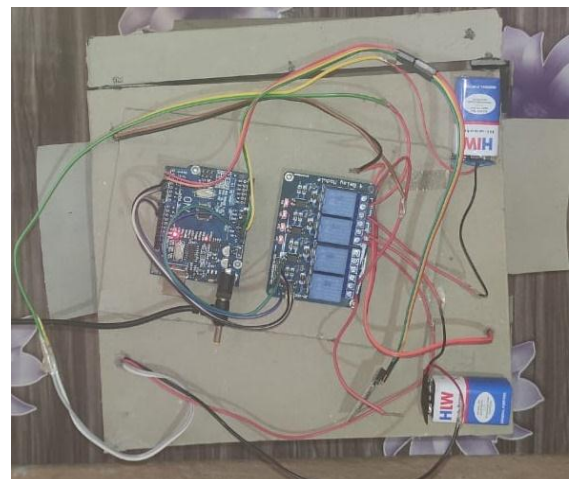


fig 1 : Circuit Model



fig 2: Seminar Hall model

In this system we are working on a seminar hall that can be used for meeting as well as presentation. In the traditional way of home automation when we hit a button only one task could perform in this system, we overcome the drawbacks of traditional home automation system and combine a specific task on a single click so the user don't need to press a multiple button for various office task.

In this system we have added a four Modes

1. Shutdown:

In this mode all appliances will be off suppose the employee haven't need of the seminar hall so he will use shutdown mode he don't need to turn off all switch manually.

2. Meeting



fig.3: Window open

In this mode the window of the seminar hall will be open using the motors and bulb will be off, for the light source we are using the solar light in this system so from the solar light we can save the electricity used for light.

3. Presentation

In this mode the window of the seminar hall will be off using the motors and bulb will be on, because when the person giving the seminar that have to be see to the person whos are listening him.

4. Video

In this mode the window of the seminar hall will be off using the motors and also the bulb, because the video made is made for the time when some video clip need to show in the seminar hall so in seminar hall in video mode must have dark.

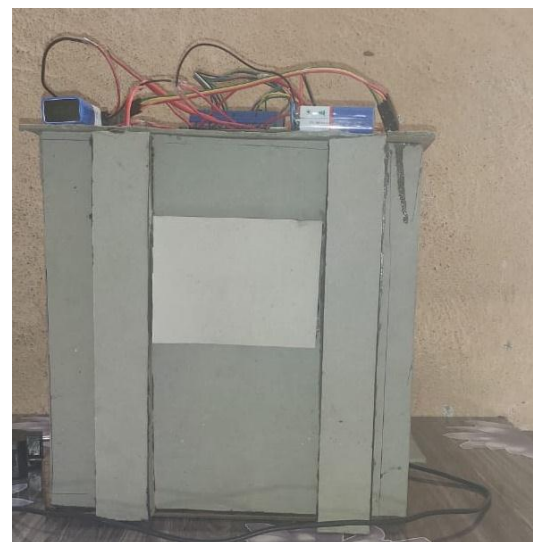


fig 4 : Window Closed

In the system we also added 4 button for fan and light because if the user wants to turn off or on the light or fan so he can manually do it

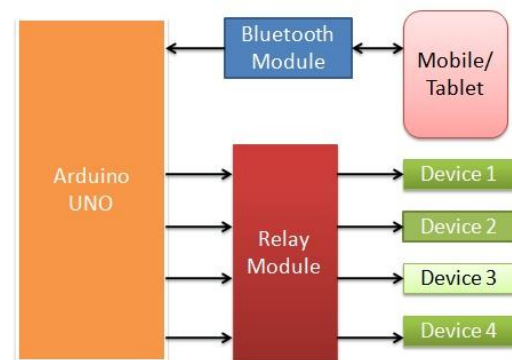


Fig. 5. Block Diagram

HAS describes a system of controllable device that work together to make your home comfortable, customized, efficient and secure. In this System there are five main parts Arduino, Bluetooth module, Relay drivers and

android application. Firstly we provide power to the Arduino with VIN pin. The Bluetooth module is also connected with Arduino to Rx and Tx pin that provides the information to the microcontroller. Arduino board reads the information and send to the relay which act as switch. In Arduino we upload the program as per requirement then it performs some task control the relay drivers.

Those all parts are connected as shown in figure

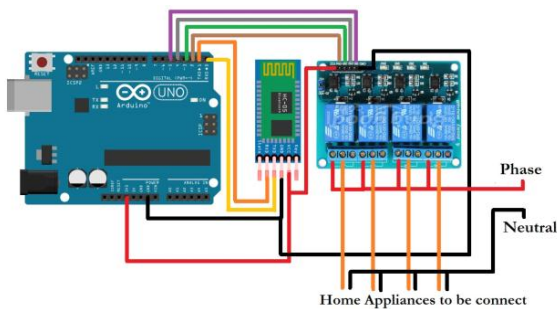


Fig. 6.Circuit diagram of home automation.

Android application are connected to the Arduino Bluetooth (HC-05).

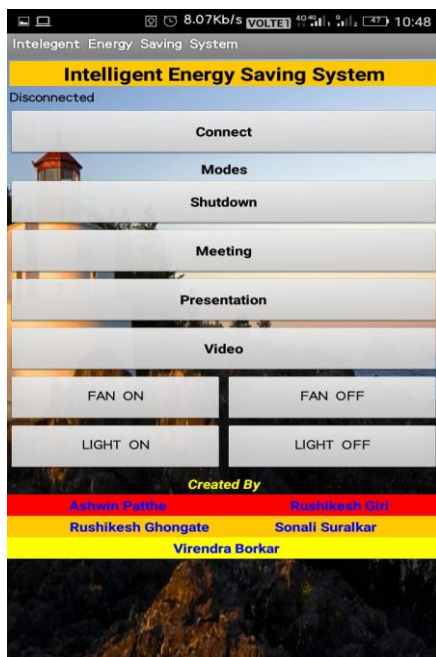


Fig. 7.Mobile android application

IV. Hardware Requirements:

1) Arduino UNO:

Arduino is a tool for control more of the physical world than your computer. It's an open-source computing platform based on a simple ATMEGA328P microcontroller IC, and a development environment for writing software for the board. The Arduino Uno is a microcontroller board b on the basis of ATmega328. Its

have 14 digital input/output pins (of which 6 we can used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything that support to the microcontroller; simply connect it to a computer with a USB cable and upload a code and use

2) Relay:

A relay is an electrical switch button that uses an electromagnet power to move the switch off to on position without touch. It need a small amount of power to turn on a it but the it can control something that draws much more power.. Different relay configurations are available like the SPST, SPDT, DPDT, which have various number of changeover contacts surface. By using proper combination of contactors, the electrical circuit can be switched on and off using arduino.

3) Bluetooth Module

Bluetooth module used in this project is HC-05, which supports serial communication type(9600bps) SPP and the UART interface. Using these features we can make serial connection with other Bluetooth enabled devices like mobile phones, tablets and laptops. The module runs on the power 3.3V to 6V.

V. Software Required

1) MIT App Inventor

MIT App Inventor is a web based application that maintained by the Massachusetts Institute of Technology (MIT) so its name is MIT App Inventor . It allows a beginners of a computer programming language to create application software(apps) for Android operating system,. It is free and open-source software released under Multi-licensing|dual licensing: a Creative Commons Attribution ShareAlike 3.0 Unsorted license, and an Apache License 2.0 for the source code.

It uses a graphical user interface (GUI) very similar to the programming languages software like MATLAB or Netbeans which allows users to drag and drop various objects like button to create an application that can run on Android mobile or tablet.

2) Arduino IDE

The Arduino IDE is a multi platform application software that is written in functions from C and C++. It is used to write and upload code to compatible boards, and also, with the other vendor development boards.

The source code for the IDE is released under the GNU General Public Licence and it supports the languages C and C++ . The Arduino IDE supplies a software library from the base project, which provides many common input and output methods.

VI. RESULT

In the traditional home automation system when the user press a button only one task can be perform but in this system we combine some task as per the office need and we name the task as a Mode, the modes and their task are followed in the following table

Modes	Appliances States		
	Light	Window	Fan
Shutdown	Off	Off	Off
Meeting	Off	On	Manually
Presentation	On	Off	Manually
Video	Off	Off	Manually

Table 1. Modes in System

VI. Future Scope

As compare to the traditional HAS our system is best and we can also include some ideas to make more effective the ideas are like follow.

1. Automatic door opening system
2. One time access to multiple admin
3. Sun tracking solar panel
4. Fan speed regulation
5. Temperature Controlled fan

VII. Conclusions

In this paper, we designed architecture for low cost and flexible office control and monitoring system using Android based Smart phone is proposed and implemented. The proposed architecture describe a Bluetooth communication as an application layer for gateway between the user and the office appliances. Any Android based Smart phone with built in support for Bluetooth can be used to access and control the devices at home.

In future works include another communication type, and reducing the wiring connection for installing the proposed system in pre-existing offices by creating a wireless network within the office environment for controlling and monitoring the smart office.

And in this paper, we demonstrated how the office automation is made, discussed about methodology and what its application can be. And in the future, on the new technology can be included which reduces human effort, which is being researched, we also talked about it. And we've created a that type of device which is compact in size, low cost, more capacity, long life and more distant signal receivers . The need of this research paper is to create a device which saves the electricity and improve human life style.

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