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VOICE ENABLED DEVICES SWITCHING FOR VISUALLY IMPAIRED PEOPLE

N. Swapna[1], P. Shabari[2], G. Shiva[3], G. Ravindranath Kumar[4]

[1, 2, 3] B.Tech (ECE), [4]Working as Professor & HoD, Department of (ECE),
Visvesvaraya College of Engineering and Technology, M.P Patelguda,
Ibrahimpatnam (M), Ranga Reddy (D), Affiliated to JNTUH, (India)

ABSTRACT

In this project it tells that the overall design of a wireless Home automation system (WHAS). This is fulfilled by the need to provide supporting systems for the old and the disabled, especially people who live alone. The automation project recognitize of voice commands which is an Analog signal that uses low-power Bluetooth wireless communication modules which are relatively cheap. The system home automation is used to control the appliances like fan ,light etc in a home or office using voice commands. The signals are received by the Bluetooth and sends the voice data to the AT89C51 controller and then the controller converts the voice into required format and then again send the data through the Bluetooth to the another Bluetooth and the devices are feely operated by the Microcontroller where they are interfaced to it.

Based on the message it received it either turns ON/OFF the devices. The system Home Automation is used by the old and disabled people for an easy way of use that can be fully operated based on voice signals.

A typical wireless system home automation allows one to control the house hold appliances from a control unit which is a wireless system. These appliances are particularly designed to be compatible with each other devices and with the control unit for home automation systems. The system receives the signals through Bluetooth transceiver and it performs the request function.

Key Words- AT89C51 Microcontroller, Bluetooth, Relay, Fan and Light.

I. INTRODUCTION

The world is moving as more and more process are being automated. Basically there are two main reasons for automating a process. First, humans tend to get bored repeating a process again and again. Second, as human beings they are prone to making errors. Automation solves both the problems. Home Automation is a Contrary to popular benefits home automation systems are very costly, by spending a small but reasonable fraction of the total cost of a newly constructed home; the home can be fully automated for the convenience of the user.

In a world where electronic gadgets and gizmos are the order of the day and have made life easy, home automation has become a necessity. The proposed system has two set of modules, control unit and the relay unit. Both the units are connected wirelessly with each having separate microprocessors so that work of each microprocessor is defined separately. Also in this module there is a voice feedback as an acknowledgement for

both vice controlled automation and automation through mobile. This will be of great help for the visually impaired user to ascertain the status of the device on issue of the command signal or the command word.

Visually impaired people mainly rely on voice commands, voice menu or voice feedbacks for any control operation. Here we integrate voice features into home automation system. Home automation is achieved by the use of voice control and mobile in this project, voice-control is used, if in case the user is within the premises of the home where the appliances are to be controlled.

When voice control is used, the user should be able to select a particular device and should be able to disable it. This should be done with the help of a wireless handheld module which provides more flexibility than a wired control module. There should be a voice feedback against the particular task has been accomplished as per the user's wish.

When the mobile control is used, the user should be able to control remotely the specific devices and enable or disable them using the mobile. Since the devices are controlled remotely, a voice feedback must be given as an acknowledgement for the completion of the specific task. This will be of great help for the visually impaired user to ascertain the status of the device on issue of the command signal or command word.

II. AUTOMATION THROUGH VOICE

Automation through voice Voice command is the preferred mode of operation for the visually impaired and also for the physically challenged people. In voice controlled automation, the voice commands to control specific devices are first stored in a memory device. When the user intends to control a device, the user speaks the control word into the microphone, which acts as the input to the hardware circuitry.

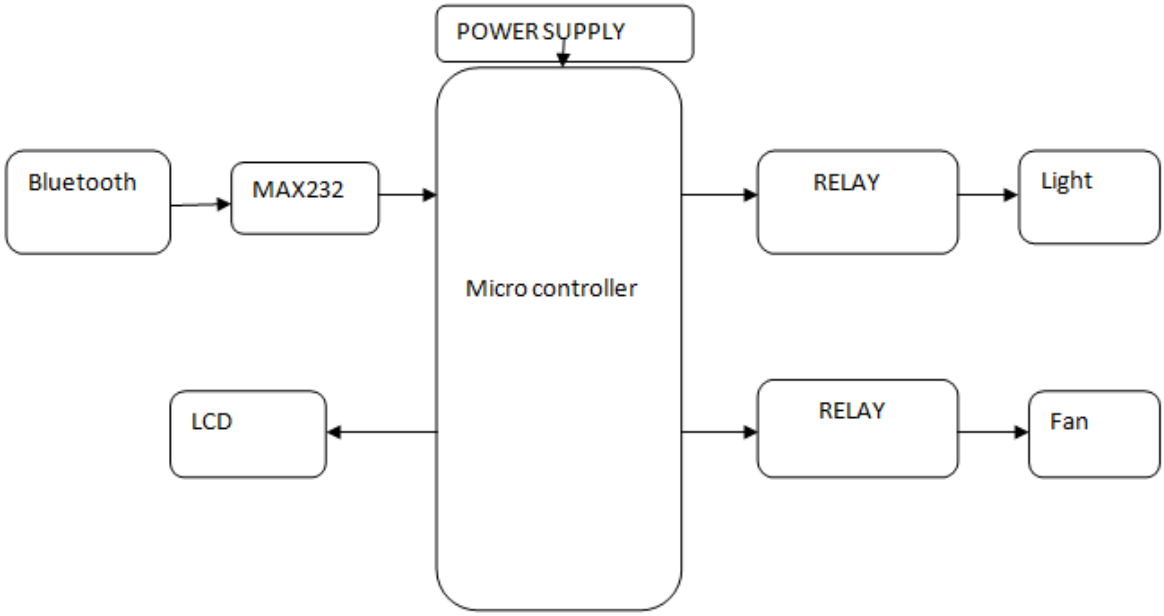
The voice recognition chip (HM2007) gets the input command word and checks whether it is already stored in the memory. If the command word is already stored, then the command word is recognized and the voice is converted in to its corresponding pre-determined digital output. The microcontroller receives the output from the voice recognition chip, which is a digital control word and then acts according to the pore-described functionality for the specific input, which is to accurate a specific relay. The relay thus actuates the device attached to it, thereby fulfilling our intention to control a device.

Voice feedbacks to indicate whether a specific task has been performed as instructed are already stored in a memory chip. So when the corresponding operation is performed, as per the user's wish, the specific voice feedback is given out through a speaker, which is an acknowledgement for the execution of the specific task to the user.

For situations where the user gives commands, for actions which have already taken place, a unique voice message mentioning "Task already done" is played. Initially the microphone which is used to give voice command input is wired to the control module. To increase the flexibility of the model, wireless mikes are used hence, the hand held unit has a transmitter and receiver, which transmits the digital output of the HM2007 chip to the microcontroller attached to the relay circuitry. The microcontroller actuates the relays connected to it based on the digital input. The relay used here is a double pole throw relay. One set of contacts is used to actuate the device and the other set of the contacts is used to determine in which state the relay is hence the state of the device too is known.

For example, when the user tries to switch OFF a device which is already switched OFF, the microcontroller ascertains this through the relay and notifies the user that the device is already in the required state. Radio Frequency (RF) technology is used for wireless connectivity, which is a low cost, low power-consuming wireless networking technology, which can be directly interfaced to the encoders and microcontrollers. It has a maximum range of 100ft at 4800bps data rate.

III. HARDWARE DESIGN



3.1 8051 Microcontroller

8051 is a family of microcontrollers. The devices we use in our project was the 'AT89S52' which is a typical 8051 microcontroller manufactured by Atmel™. The block diagram of 8051 by Atmel in their datasheet that showed the architecture of 89S52 device seemed a bit complicated.

The controller 89S52 has four different ports, each one having eight Input/output lines and a total of eight Input/Output lines. These ports can be used as output DATA and orders do other devices, or to read the state of a sensor, or a switch. The maximum ports of the 89S52 have 'dual function' meaning that they can be used for 2 different functions.

The first port is used for performing input/output operations and the second port is used to implement particular features of the Microcontroller like counting the external pulses and interrupting the execution of the program according to external events, and also performing serial data transfer or connecting the chip to a computer to update the software. Each port has eight pins, and will be used as an 8-bit variable called register, each bit is connected to a different Input/Output pin.

There are two different memory types: RAM and EEPROM. Shortly, Random Access Memory is used to store variable during program execution, while the EEPROM memory is used for storing the program itself, that's why it is often referred to as the 'program memory'.CPU (Central Processing Unit) is the heart of the micro controllers.

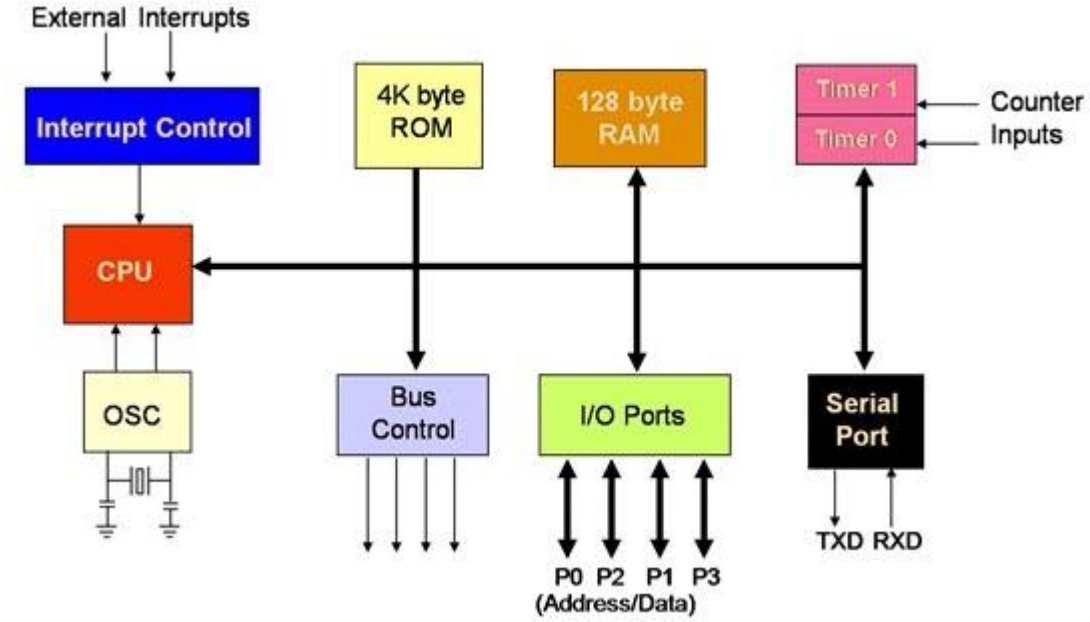


Fig: Block diagram of 8051 micro controller

3.2 Liquid Crystal Display

A sixteenx2 fluid precious stone alphanumeric showcase, implies that it will show 16 characters for every line and there are couple of such lines. Amid this LCD each character is shown in 5x7 part grid. This LCD has 2 registers, to be specific, Command and data register i.e. information register. The order register stores the charge headings given to the LCD. A summon is partner degree direction given to LCD to attempt and do a predefined undertaking like introducing it, clearing its screen, setting the marker position, prevailing show and so on the information register which stores the data to be shown on the LCD. The data is that the ASCII worth of the character to be shown on the LCD.

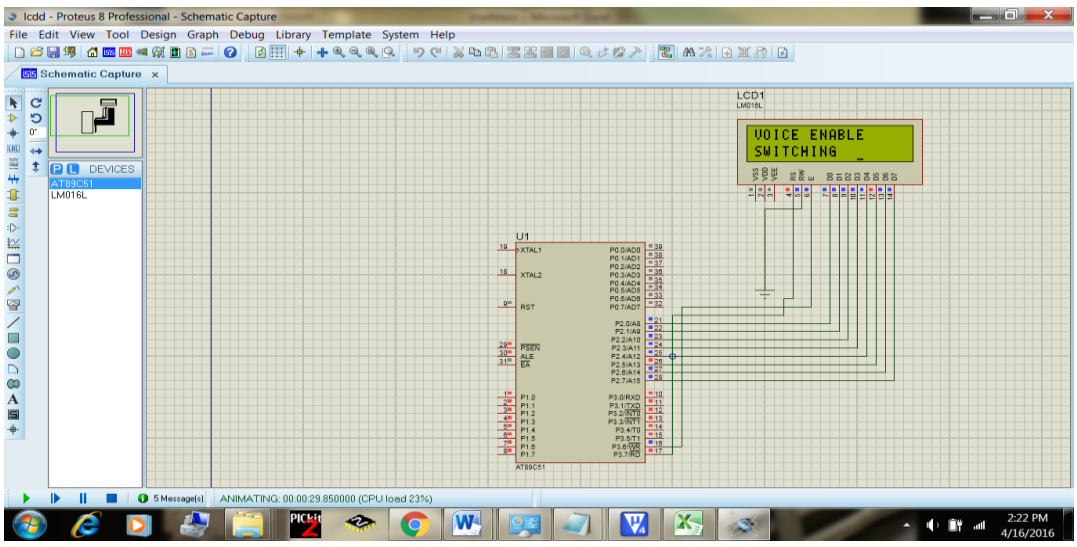


FIG: LCD interfacing with 8051micro controller

3.3 Bluetooth

Basically, Bluetooth is that the term accustomed describes the protocol of a brief vary (10 meter) frequency-hopping communication system between devices. These devices implementing the Bluetooth technology area

unit termed Bluetooth - enabled. Documentation on Bluetooth is split into 2 sections, the Bluetooth Specification and Bluetooth Profiles.

- The Specification describes however the technology works (i.e. the Bluetooth protocol architecture),
- The Profiles describe however the technology is employed (i.e. however completely different elements of the specification are often accustomed fulfill a desired operate for a Bluetooth device).

3.4 MAX232

Max232 is designed by Maxim Integrated Products. This IC is vastly used in RS232 Communication systems. Here it conversion of voltage level is required to make TTL devices to be compatible with PC serial port and vice versa. This chip consists of some voltage levels which can be converted to Desired Level. This device is powered by a single +5 volt power supply and its output can reach +7.5 volts.MAX232 comes in 16 Pin Dip and many other packages and it contains Dual Drivers. It can be used as a hardware layer convertor for 2 systems to communicate simultaneously.Max232 is one of the versatile IC to use in most of the signal voltage level conversion problems. Premier MAX232 is used in Serial communication. Problem arises when we have to communicate between TTL logic and CMOS logic based systems. RS232 is internationally defined standard named as EIA/TIA-232-E and in this standard logic 0 is the voltage between +3 to +15 and logic 1 is defined as the voltage between -3 to -15.In TTL logic 0 is defined is by 0 volt and 1 is defined by 5 volt so in this scenario this is a very handy IC to be incorporated.

3.5 Relay

A transfer is relating electrically worked switch. A few transfers use partner magnet to consequently work a switch, however elective in operation standards are utilized, similar to strong state transfers. Transfers territory unit utilized wherever it's essential manage a circuit by a low-power signal (with complete electrical confinement in the middle of control and controlled circuits), or wherever numerous circuits ought to be controlled by one sign. The essential transfers were utilized in long separation broadcast circuits as enhancers: they enduring the sign returning in from one circuit and re-transmitted it on another circuit. Transfers were utilized broadly as a part of telephone trades and early PCs to perform coherent operations.

3.6 Light and Fan

A roof fan could be a mechanical fan, regularly electrically controlled, suspended from the roof of a territory that uses center point mounted turning oars to stream into air. A roof fan turns preferably more gradually than an electrical table fan; it cools people adequately by bringing moderate development into the generally still, hot demeanor of a range, causation physical

IV. SOFTWARE DESIGN

To finish the undertaking on equipment need to installed programming on to the controller utilized as a part of this venture for that reason we need programming's similar to Keil u vision and glimmer enchantment those are examined in given beneath

Compiler that keeps running on one pc however delivers PC code for an unmistakable sort of pc. Cross compilers square measure usual produce PC code which will keep running on PCs with a substitution plan or on exceptional reason gadgets that can't have their own compilers. Cross compilers square measure extremely in vogue for implanted improvement, wherever the objective more likely than not couldn't run a compiler. Normally relate degree inserted stage has limited RAM, no plate, and confined I/O ability. Code are frequently adjusted and accumulated on a brisk host machine, (for example, a tablet or working framework workstation) and in this way the resulting feasible code will then be downloaded to the objective to be tried. Cross compilers square measure helpful at whatever point the host machine has a ton of assets (memory, circle, I/O and so on) than the objective. Keil compiler is one such compiler that backings a gigantic assortment of host and target blends. It underpins as an objective to eight piece microcontrollers like Atmel and Motorola and so forth. Streak Magic is partner application created by Embedded Systems Academy to allow you to just get to the choices of a microcontroller gadget. With this project you'll have the capacity to delete individual squares or the entire nonvolatile stockpiling of the microcontroller.

V. WORKING DESCRIPTION

Here we are using 8051(AT89S52) MICRO-controller. The LCD is connected to the PORT-2. We are using 8-bit LCD. So we used 8-data lines. The register select is connected to the P3.7 and enable is connected to P3.6. So whatever the data we want we can display it on LCD. Light and fans are connected to P0.7 and P0.5 pins respectively through relay circuit. We are using UART0 for the Bluetooth interfacing through serial communication for the purpose of to controlling through voice. Lights and fans are control through voice which is receive from Bluetooth device.

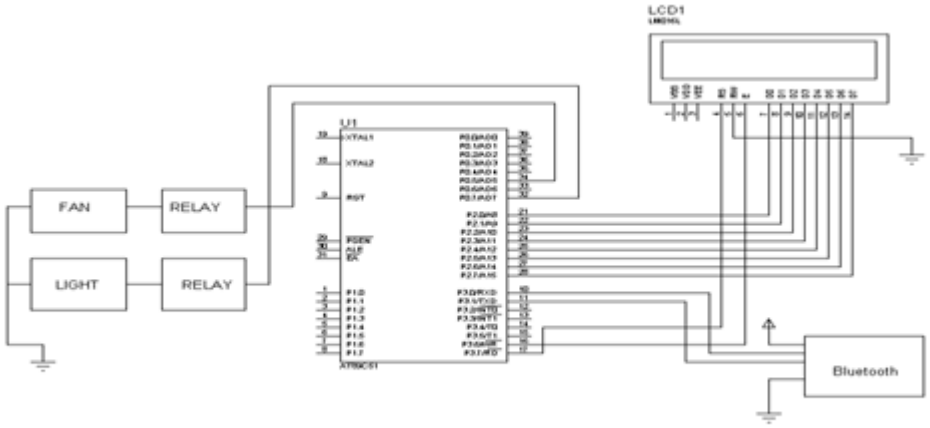


Fig: Schematic diagram of the project

VI. RESULTS

Here the results are shown our project "VOICE ENABLED DEVICES SWITCHING FOR VISUALLY IMPAIRED PEOPLE". Command words to control specific devices are first stored using the voice recognition kit with the help of bluetooth in the RAM in the training mode. When the user speaks a command word during the recognition mode, the circuitry identifies whether the command word has been previously stored in the RAM or not. On successful recognition of the command word to control a specific device, the corresponding

digital signal is sent to the microcontroller which control specific device through the relay circuitry. A voice feedback is given out for the benefit of the user as an acknowledgement. Light bulbs are used to simulate real time appliances.

VII. CONCLUSION

From this project we can conclude that voice enabled devices switching for visually impaired people, they can control the devices by message in Bluetooth device, it can send a command to the microcontroller through relay circuit and the lights and fans will ON.

AUTHOR DETAILS

N. SWAPNA

B.Tech (ECE) from Visvesvaraya College of Engineering and Technology, M.P Patelguda, Ibrahimpatnam (M), Ranga Reddy (D), Affiliated to JNTUH, India.

P.SHABARI

B.Tech (ECE) from Visvesvaraya College of Engineering and Technology, M.P Patelguda, Ibrahimpatnam (M), Ranga Reddy (D), Affiliated to JNTUH, India.

G.SHIVA

B.Tech (ECE) from Visvesvaraya College of Engineering and Technology, M.P Patelguda, Ibrahimpatnam (M), Ranga Reddy (D), Affiliated to JNTUH, India.

G.RAVINDRANATH KUMAR (HOD)

Working as Professor & HOD (ECE) from Visvesvaraya College Of Engineering And Technology, Patelguda, Ibrahimpatnam, RangaReddy dist., Telangana, INDIA.