# Voice Based Hot/Cold Water Dispenser System Using Arduino

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## ABSTRACT

**BACKGROUND AND OBJECTIVE**: The objective of this research article is that the system is fully based on voice, which uses Arduino Uno. This water dispenser system also uses IR sensor, Bluetooth module, Ac motors. In this work, the voice is detected by the Bluetooth Module, then it sends the respective information to the microcontroller, to understand whether the water required by the person should be hot or cold.

**METHODOLOGY:** The microcontroller processes the information to the IR sensor to determine where the glass is placed below the pipe or not. The system uses IR sensors to detect the presence of water glass, accordingly the motor starts and the water flows through the pipes from the particular jar (hot/cold).If the glass is not placed, the sensor sends respective signal to the motor, which does not cause the water to flow through the pipe until the glass is placed. This system can be used at home, offices etc.to get hot or cold water by just giving voice command.

**KEYWORDS:** Microcontroller, Bluetooth Module, IR sensor, Voice Based Hot/Cold Water

## 1. INTRODUCTION

Voice Based Hot- Cold Water Dispenser System using Arduino is the project which will be very useful for old-age people and disabled people, basically for one' s who cannot perform basic activities efficiently. It is this idea which corresponds to the new era of automation and technology. The main of this automation system is to make li e easier .Mobile devices are very common among everyone due to its user - friendly interface and portability features. In this project we aim to control electrical home appliances by android and voice commands using Bluetooth as

communication protocol between Arduino and android devices via Bluetooth Arduino becomes a better option for home.

The humble **water cooler** - a device to chill (and more recently, heat) your drinking water bean ads humbly as it stands as a piece of equipment today. The water Cooler- from a simple block of ice dating back to the Victorian days to now-being noted as one of the most important pieces of equipment that has contributed to the health and well- being of children andadults.

In modern times, the water cooler is now more preferred source of water over a variety of alternatives thanks to its cost effectiveness, portability and, of-course, provision of safe drinking water for all to enjoy.

Modern coolers are fitted with an internal air filtration system. This system prevents bacteria from entering your machine- negating the possibility of contaminated water, or the infiltration of unwanted contaminants into the machine itself . This system also allows for the preservation of the water - giving you the best possible taste without any unwanted odors either.

The water reservoirs housed within the cooler- f or both the hot and cold water - are made from food grade stainless steel. This material is one of the most resistant to the growth of bacteria.

An **instant hot water dispenser** or **boiling water tap** is an appliance that dispenses water about $94^0$ c (201 F) (near boiling).There are hot- only and hot and cool water models, and the water may be filtered as well as heated. Instant hot water dispenser s became popular in the 1970s. Instant hot water dispensers are very similar to portable shower devices; the latter is fitted with a heating element and quickly heats up water, once a switch has been activated.

Audrey system, built by Bell lab since 1952 considered to be the first **speech recognition device**, recognized only ten digits spoken by single **voice**. This was followed by the shoebox machine, developed by I BMin 1962, which could recognize 16 English words, 10 digits and 6 arithmetic **commands**.

## 2. IMPLEMENTATION WATER DISPENSER SYSTEM

In this research paper, we are using voice commands to get cold or hot waters. By using Bluetooth we can give our commands. Based on that we will get water .IR sensors are placed to check the glass presence. This system is fully based on voice command, which uses Arduino Uno board, this water dispenser system also uses I R sensor,j for storing water,pipes and motor. I n this project the voice is detected by the Bluetooth Module, then the sensor sends the respective information to the microcontroller, to

understand whether the water required by the person should be hot or cold. The microcontroller processes the information to the I R sensor to determine where the glass is placed below the pipe or not. The system uses I R sensor is to detect the presence of water glass, accordingly the motor starts and the water f lows through the pipes from the particular (hot/ cold).I f the glass is not placed, the sensor sends respective signal to the motor, which does not cause the water to f low through the pipe until the glass is placed. This system can be used at home, office setc.to get hot or cold water by just giving voice command.

In this research article, we developed a "Home Control Automation" Android App which will do the process of authentication of the user by Register and Login. After Successful Login user may give Voice Command for operation and then he/ she logout after completion of operation of ON/ OFF on specify Electronic Device.

A Voice to Text conversion app named " Home Control" is an android app in which voice command is converted to the text. Whichever command is given is converted to text and processed in Arduino and required operation is performed or Electronic Devices. In Fig, An App interface is shown where user command " Lights On" is given and Arduino has received the input. It performed the task and acknowledgement is given back and displayed in the App interface in Snack bar about the task performed like here" All Or "is displayed.

Overall the working of this project is like a smartt device. Having facility to voice control, it will have a cooling chamber made of peltie modules. I t will have a smart t f unction like when we want the water ( hot/ cold) we just need to give voice command to our android phone. Because android phone work asa mic. Arduino work as processor and Led will workkas display output water heat sink will help to dissipate heat from specific semiconductor s, minimize power losses during operation and protect power electronics components from overheating and failure. Relay module 4 channel- This is a 4-channel Relay interface board that allows you to control various appliances, and other equipment's with large current. Trough pumps the cold or hot water gets way to out.

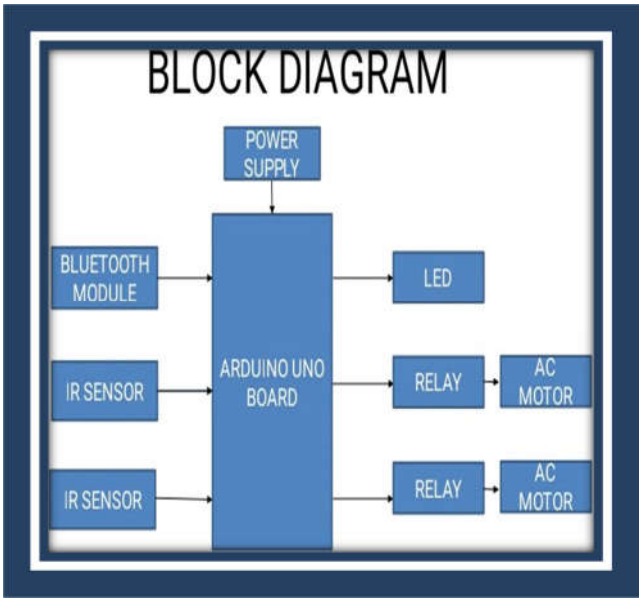
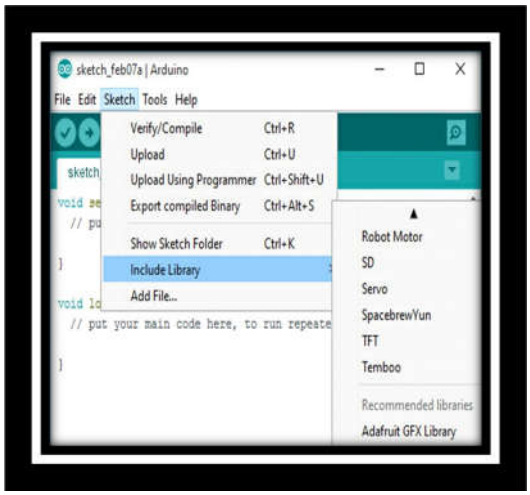



Fig 2.1 Block diagram of proposed system

SOFTWARE IMPLEMENTATION:

- Libraries are very useful for adding the extra functionality into the Arduino Module. There is a list of libraries you can add by clicking the Sketch Button in the Menu bar and going to include library.




As you click the Include Library and add the respective library it will on the top of the sketch with# include sign. Suppose, I include the EEPROM Library, it will appear on the text editors as

# include<EEPROM.h>

Most of the Libraries are preinstalled and comes with the Arduino Software. However, you can also download them from the external sources.

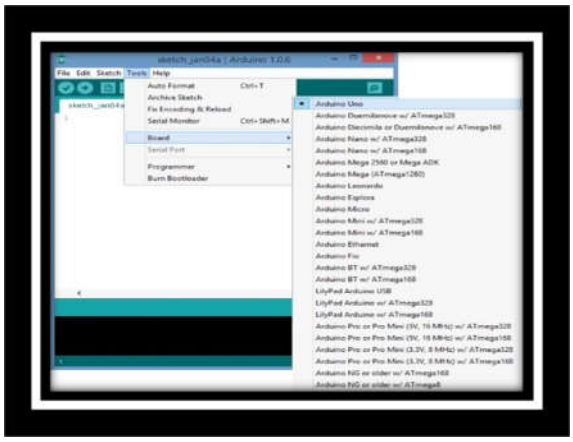
### ➢ Making pins Input and Output:

The digital Read and digital Write are used f or addressing and making the Arduino pins as an input and output respectively.

These commands are text sensitive i.e., you need to write them down the exact way they are given like digital write starting with small " d" and write with capital "W". Writing it down with digital Write or digital Write won't be calling or addressing any function.

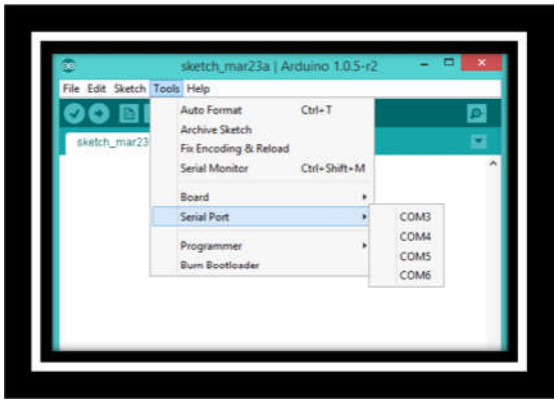
### ➢ How to select the board:

In order to upload the sketch, you need to select the relevant board you are using and the ports for that operating system. As you click the Tools on the menu, it will open the figure below.



➢ Just go to the "board" section and select the board you aim to work on .Similarly. COM1, COM2, COM4, COM5, COM7 or higher are reserved f or the serial and USB board. You can look f or the serial USB device in the port section of my Windows Device Manager.

- Following figure shows the C0M4 that I have used for my project, indicating the Arduino Uno with C0M4, port at the right bottom corner of the screen.



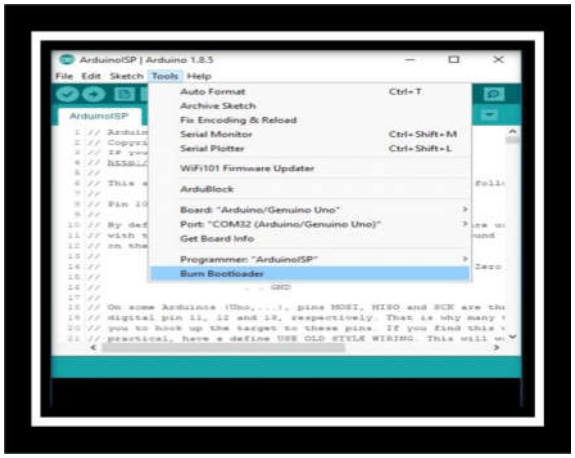

- After correct selection of both board and Serial port, click the verify and then upload button appearing in the upper left corner of the six button section or you can go to the sketch section and press verify/ compile and then upload.
- The sketch is written in the text editor and is then saved with the file extension.
- It is important to note that the recent Arduino Modules will reset automatically as you compile and press the upload button the I DE software, however, old version may require the physical reset on the board.
- Once you upload the code, Tx and Rx LEDs will blink on the board, indicating the desired program is running successfully.

Note: The port selection criteria mentioned above is dedicated for Windows operating system only, you can check this Guide if you are using Mac or Linux.

The amazing thing about this software is that is no prior arrangement or bulk of mess is required to install this software, you will be writing your fir st program within 2 Minutes after the installation of the I DE environment.

## ➢ BOOT LOADER

As you go to the tools section, you will find a Boot Loader at the end. I t is very helpful to burn the code directly into the controller, setting you free from buying the external burner to burn the required code.




When you buy the new Arduino Module, the Boot Loader is already installed inside the controller. However, if you intend to buy a controller and put in the Arduino Module, you need to burn the Boot Loader again inside the controller by going to the Tools Section and selecting the burn Boot Loader. A Voice to Text conversion app named "Home Control" is an android app in which voice command is converted to the text. Whichever command is given is converted to text and processed in Arduino and required operation is performed or Electronic Devices. In Fig, An App interface is shown where

user command "Lights On" is given and Arduino has received the input. It performed the task and acknowledgement is given back and displayed in the App interface in Snack bar about the task performed like here" All Or “is displayed




Fig 1. An App Interface

Example: If a person gives a command "COLD" the sensor will sense person command and orly cold water will be dispensed.

## 3. PSEUDO CODING

```
#include<Liquid Cr ystal.h>
int hot_ motor=7; int cold_ motor=4: int hot_
sensor =5; int cold_sensor =6; int hot_ value;
int cold_ value;
int green_ led=8; int red_ led=9; void setup()
{ lcd begin( 16, 2); serial.begin(9600);
PinMode(hot_sensor,INPUT_PULLUP); PinMode(
cold_sensor,INPUT_PULLUP); PinMode(hot_
motor, OUTPUT);
PinMode(cold_motor,OUTPUT); digital Write(
hot_motor,LOW); digitalWrite(cold_motor,
LOW); lcdprint(" Voice based hot &" ); lcdset Cur
sor(0,1);
Lcdprint ("cold water " ) ; delay(2000);
Pin Mode ( green_ led, OUTPUT); Pin Mode ( red_
led,OUTPUT) ;
Digital Write (green_ led,LOW); digital Write(
red_ LOW);
}
Void loop()
{

char ch;
if ( Ser ial available()>0)
{
ch=Serial read() if ( ch==h)
{
hot_value=digital Read(hot_sensor); if(hot_
value==LOW)
{
lcd clear();
lcd.print(' hot side on' ) ;
digitalWrite(hot_motor,HI GH); digitalWrite(
red_ led, HI GH);
delay(4000);
digitalWrite(hot_motor,LOW); digitalWrite(red_
led, LOW);
}
else
{
lcd.clear(); delay(2000);
lcd,print(" late receive" ); delay(1000);
lcd.clear();
lcd.print(" give cmd to get" ); delay(1000);
}
}
else if ( ch==c)
{

cold_value=digitalRead(cold_sensor); if(cold_
value==LOW)
{

lcd.clear();
lcd.print(' cold side on' ) ;
digitalWrite(cold_motor,HI GH); digitalWrite(
grren_ led, HI GH); delay(4000);
digitalWrite(cold_motor,LOW); digitalWrite(
green_led,LOW);
}
else
{lcd.clear(); delay(2000);
lcd.print(" late receive" ) ; lcd.print('give and
to get'); delay(1000);
}
}
}
Else
{ lcd.clear();
lcd.print(" no cmd getting" ); delay(2000);
}
```

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## 4. CONCLUSION:

This work is easy in Operation and cost maintenance is low. Hence this project is mostly designed to get the hot or cold water by giving through our own voice command. This is mainly very useful for old age people and in Hospitals and one's who cannot perform basic activities efficiently. The objective of the project was achieved. The whole product can be redesigned f or it to be aesthetically pleasing for its better usability. It can be used f or other liquid refreshment. This system can also be converted into I OT based. In future we can add PH sensor and conductivity sensor in the given model f or detecting the PH level and conductivity of water supply.

## 5. REFERENCES

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