

## Voice Based Hot and Cold-Water Dispenser Using Raspberry Pi

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### ABSTRACT

In today's day to day life automation can play a major role. Automation makes thing simple. The main attraction of any automated system is reducing human labour, efforts, time and errors due to human negligence. A Raspberry Pi is a credit card-sized computer which can be used for developing various applications. This project represents a flexible way to control devices. In this project we are working on an android application where a user will provide voice commands for controlling devices such as "COLD & HOT" which will be connected to raspberry pi and according to it the required process will work via Bluetooth connectivity. This automation can be used majorly not only in home but offices and hospitals also in old age home. It allows controlling number of home appliances simultaneously. Python is used as the main programming language which is default, provided by Raspberry Pi. This system requires micro SD card with an OS (LINUX) for Raspberry Pi. Using this we can say a regular home is converted to smart home.

**Keywords** : Water Dispenser System, Raspberry Pi

### I. INTRODUCTION

Voice Based Hot Cold-Water Dispenser System using Raspberry Pi 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 the idea which corresponds to the new era of automation and technology. The main aim of this automation system is to make life 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 voice commands using Bluetooth as communication protocol between Raspberry Pi and Android device via Bluetooth. Raspberry Pi 3 becomes a better option for home.

The humble **water cooler** – a device to chill (and more recently, heat) your drinking water has been as 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 and adults alike.

In modern times, the water cooler is now a 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 odours either.

The water reservoirs housed within the cooler – for 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 at about 94 °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 dispensers 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 Labs in 1952 considered to be the first **speech recognition device**, recognised only ten digits spoken by a single **voice**. This was followed by the Shoebox machine, developed by IBM in 1962, which could recognise 16 English words, 10 digits and 6 arithmetic **commands**.

## NEED

The demography of the world population shows a trend that the elderly population worldwide is increasing rapidly as a result of the increase of the average live expectancy of people. Caring for and supporting this growing population is a concern for governments and nations around the globe. Home automation is one of the major growing industries that can change the way people live. Some of these home automation systems target those seeking luxury and sophisticated home automation platforms others target those with special needs like the elderly and the disabled. The aim of the reported is Voice Based

Hot Cold-Water Dispenser System using Raspberry Pi to provide those with special needs with a system that can respond to voice commands and control the on/off status of electrical devices. AND The water is one the basic need. The system should be reasonably cheap, easy to configure, and easy to run.

## OBJECTIVE

The objectives of the system are:

1. To reducing human labour, efforts, time using voice commands.
2. To help the disabled and elderly people.

It can be used by two types of users:

1. Elderly people.
2. Disabled people.

Elderly and disabled people can use this system for controlling Temperature of Drinking water such as COLD & HOT.

This system can be use in Hospitals And one's who cannot perform basic activities efficiently

## II. LITERATURE SURVEY

Voice controlled House Automation System leverages the power of Arduino to provide a holistic voice controlled automation system [1] Using Natural Language Processing and the available hardware in most smartphones, it translates voice to be used for controlling electrical devices [2] The voice recognition-based home automation system was built and implemented. The system is specially designed for the people suffering from paralysis and also for the elderly people. A wooden adjustable bed fitted with motorized jack is modelled rather than building a mechanical base with linear actuators which is proven to be very economic [3] The system as the name indicates, Android based home automation makes the system more flexible and provides attractive user interface compared to other home automation systems. In this system we integrate

mobile devices into home automation systems. A novel architecture for a home automation system is proposed using the relatively new communication technologies [4] This project covers most important feature, in which it could provide the complete smart home environment. The voice-controlled home automation using Raspberry Pi is projected for the easy use and control of electronic devices by old age and disabled people [5] The communication link between the appliances and remote user plays an important role in automation. In this study we proposed a system that controls electric appliance via voice when the user is in remote area, and also it controls the appliances through home mobile.

### III. METHODS AND MATERIAL

In this project, we developed a “Home Control” 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 specified 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 Raspberry Pi and required operation is performed on Electronic Devices. In Fig, An App interface is shown where user command “Lights On” is given and Raspberry Pi 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 On” is displayed.

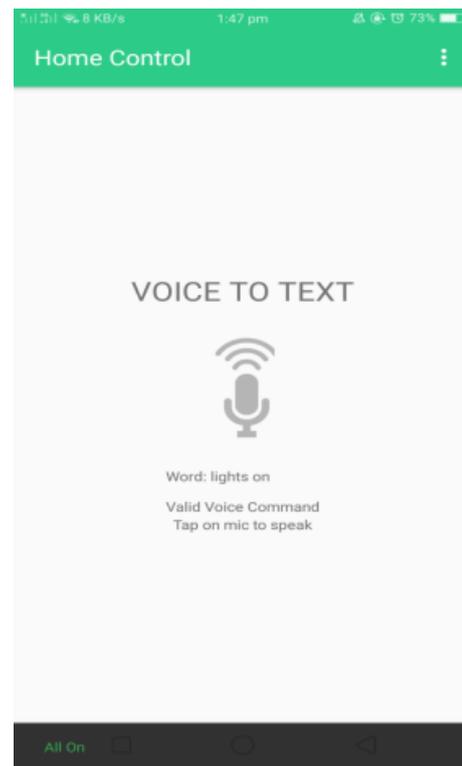


Fig 1. An App Interface

Example: If a person gives a command “COLD” the sensor will sense person command and only cold water will be dispensed.

### MATERIAL

#### Basic blocks diagram of system with description

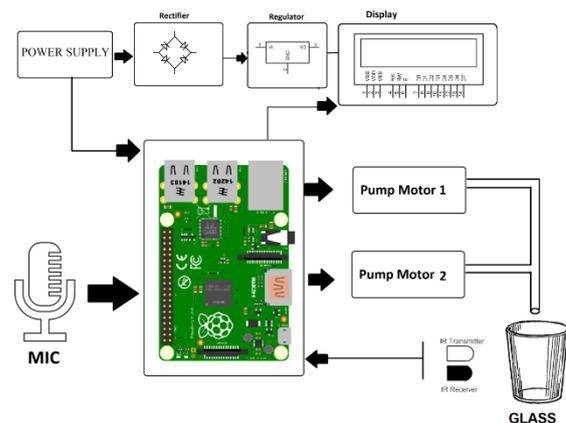


Fig 2. Block diagram of Hot and Cold Water Dispenser using RPi

## Explanation -

Overall the working of this project is like a smart device. Having facility to voice control, It will have a cooling chamber made of Peltiermodules.

It will have a smart function like when we want the water (cold /hot) we just need to give voice command to our android phone. because android phone work as a mic.

R.pi work as processor and Lcd display will work as display output water heat sink will help todissipate heat from specific semiconductors, 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 pump the cold or hot water get way to out.

**Raspberry Pi Board-** The raspberry pi board comprises a program memory (RAM), processor



SD card - STORE THE DATA

For raspberry pi class 10 SD card are the best.



## Bluetooth module-TO RECIVE THE SIGNAL

Bluetooth Module has 6 pins- Vcc, GND, TX, RX, Key, and LED. It comes pre-programmed as a slave, so there is no need to connect the Key pin, unless you need it change it to Master Mode.

## Pump -TO OUTLET WAY THE WATER

## Water heat sink

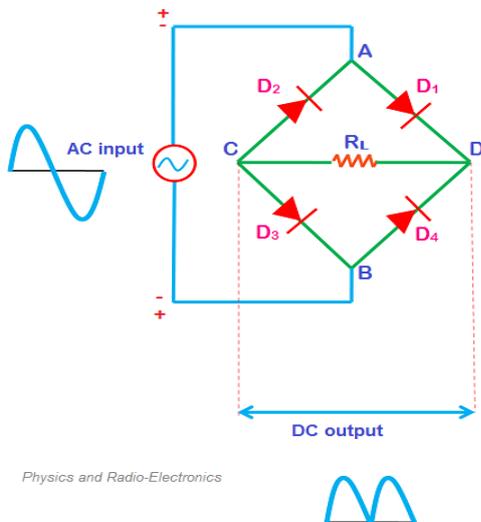
Liquid **Heat Sinks**. They offer **heat dissipation** rates that are 15 to 25 percent higher than those of conventional cooling systems. That is why liquid **heat sinks** are still the most powerful cooling components. Liquid **heat sinks** can be operated with fluids such as **water**, oil and alcohol, or with gaseous media



**LCD 16\*2-** TO DISPLAY THE OUTPUT Liquid Crystal Display (LCD) is widely used in various electronics' applications. It is commonly used in various systems to show different status and parameters. LCD16x2 has 2 lines with 16 characters in each line. Each character is made up of 5x8 (column x row) pixel matrix



**Bridge rectifier** -A bridge rectifier is a type of full wave rectifier which uses four or more diodes in a bridge circuit configuration to efficiently convert the Alternating Current (AC) into Direct Current (DC).



Physics and Radio-Electronics

Fig: Bridge Rectifier

**SMART PHONE –TO DETECT THE VOICE AND COMMAND THE R.PI VIA BLUETHOOH**

Peltier modules.

### Software Requirements

**Python** - Raspberry Pi Programming Language

**Python** is an interpreted, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

**OS:** Linux

Linux was originally developed for personal computers based on the Intel x86 architecture, but has since been ported to more platforms than any other operating system. Linux is the leading operating system on servers and other big iron systems such as mainframe computers, and the only OS used on TOP500 supercomputers (since November 2017, having gradually eliminated all competitors). It is used by around 2.3 percent of desktop computers. The Chromebook, which runs the Linux kernel-based Chrome OS

## IV. CONCLUSION

### 4.1 FEATURES

- It has two temperatures command over voice such as cold and hot.
- It is made up of abs plastic which is absolutely safe and gives high performance along with the increased durability.
- It is a high functioning device which can be installed without any problems. It is also affordable in nature so that everyone can buy this water dispenser
- LCD for showing command

### 4.2 APPLICATION

- Use **hot water in potpourri** to intensify the scent and feel refreshed every time you enter the house by using voice.

- Mixing packets of cool aid, juice and flavoured drink mixes.
- This system is mostly use in old age home and in Hospitals And one's who cannot perform basic activities efficiently
- Any office where you see patients or clients on a daily basis. Anyone that comes into your waiting room that is thirsty is able to grab a drink right from the dispenser.
- In any gym, for quick work out hydration.

#### 4.3 ADVANTAGES

1. SPACE SAVING
2. TIME SAVING
3. REDUCE MEN POWER
4. PORTABLE
5. They do not require plumbing, Does not require technical expertise to handle them.

#### 4.5 FUTURE SCOPE

- The whole product can be redesigned for it to be aesthetically pleasing and for its better usability.
- Can be used for other liquid refreshment.
- This system can also be converted into IOT based.
- In future we can add PH sensor and conductivity sensor in the given model for detecting the PH level and conductivity of water supply.

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