COZMO- A VOICE CONTROLLED ASSISTANT

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Abstract - *Cozmo brings imaginations to life. We are expecting a smart device which can be handled and used by the people with fewer efforts. It a voice controlled assistant which can be used for getting information like current temperature, humidity level, time etc. Cozmo is aimed at making live easier by providing a hands-free access to the required information instantly. This device come into action when the user is busy in some other work or household chores, he/she needs to pass the voice instructions only and the Cozmo is all set to equip you with the asked information. Cozmo is supposed to be a good aid for the visually impaired people who cannot always type or switch the button to access the information.*

Key Words: **Arduino Uno Microcontroller, Bluetooth Module, DHT11 (Temperature & Humidity Sensor).**

1. INTRODUCTION

The aim of this project is to develop an IOT based Voice Controlled Assistant (Cozmo) that takes input from the master (user) and tries to provide the appropriate reply. Cozmo is expected to equip the user with information like Current Temperature, Humidity, Time. Wait. Are you wondering that what would be the medium of input for the device? So we must tell you, as the name itself suggests, the input will be in the form of sound waves. And user is not even bothered to click buttons all the time to get the information out of Cozmo.

COZMO primarily aims at providing basic info. to the users during their daily hustle when they do not have sufficient time to check their smartphones. Cozmo is a Hands-free device and is always there to hold your backs when you're busy making coffee for your loved ones or watching your

favorite soccer match. All you have to do is to- Speak**.** Relax, and sit back Cozmo is an interactive assistant equipped with sensors of high accuracy, so the chances of providing ambiguous data is quite negligible. Till now we didn't have encountered any serious issues that can hamper the user experience.

2. HARDWARE DESIGN
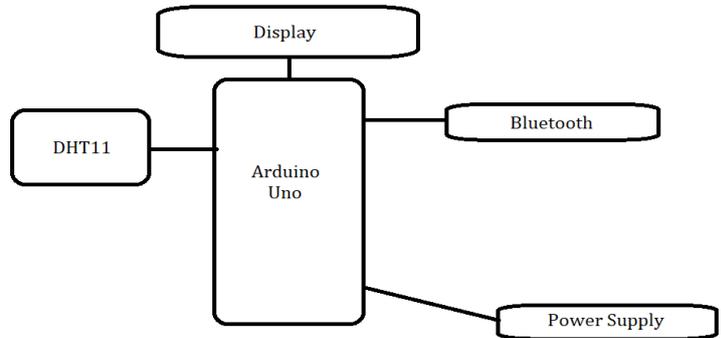
Fig: Block Diagram of COZMO

2.1 8051 MICROCONTROLLER

8051 microcontroller comprises of 40 pins, in those pins 32 pins are I/O pins and remaining 8 pins are unique function pins. In 8051 RESET pin is utilized for reset or refresh the program and crystal oscillator is utilized for producing the pulses using 11.0592 MHz frequency.
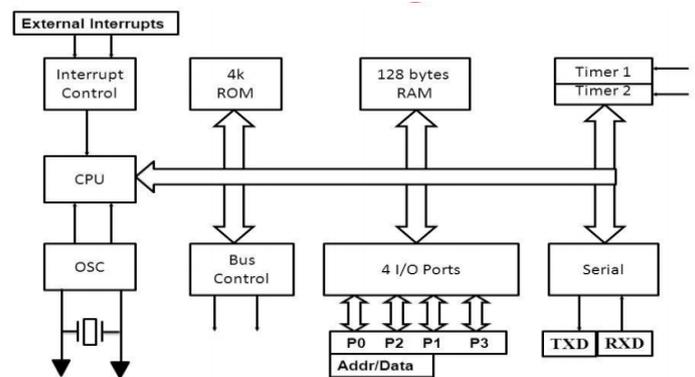
Fig: 8051 block diagram

2.2 Bluetooth Module

We are using HC-05 Bluetooth module foe our project purpose fulfilment. Taking a closer look at HC-05 we will find out that unlike HC-06, which can only be set as a slave, HC-05 can be set both as a master as well as a slave. This facilitates communication between two different Arduino boards. Talking of the versions, this module comes with certain different variants but working with the module that comes integrated on a breakout board is always recommended because of the fact that module on a breakout board is way more easier to connect than any other version.

The Bluetooth module HC-05 is a SPP (Serial Port Protocol) module, which uses Serial Communication to communicate with the Arduino or other microcontrollers.
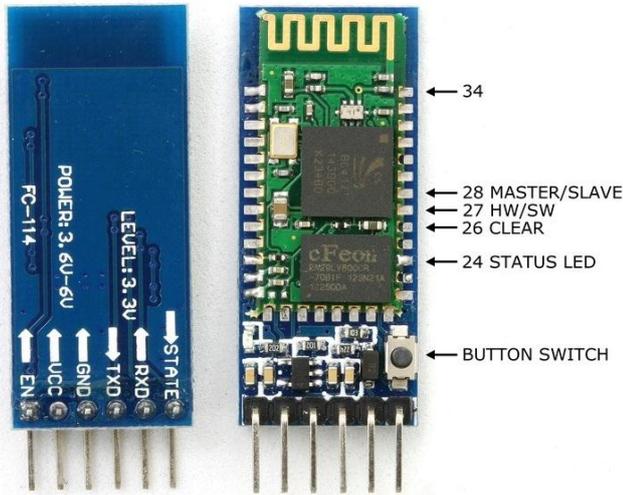
Fig. Bluetooth Module

2.3 DHT11

DHT11 is a digital sensor which is used to measure the temperature and humidity of the area in which it is located. It is equipped with a sensor being used for measuring the humidity and a thermistor to examine the air around sensor. The sensor consist of calibrated digital signal output of the temperature and humidity. The data being produced by this sensor is said to have an interval of 2 seconds between every subsequent data generation, i.e. you have to wait for 2 seconds every time to get a new data. So the readings can be 2 seconds old. To guarantee the better reliability and stability of the sensor, resistive sense of wet components along with a temperature measuring device is being embedded in the sensor and the sensor is further connected to a 8-bit microcontroller (Arduino Uno in this case).
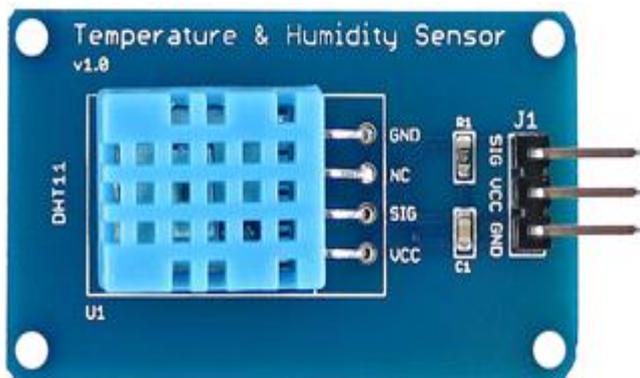
Fig. DHT11
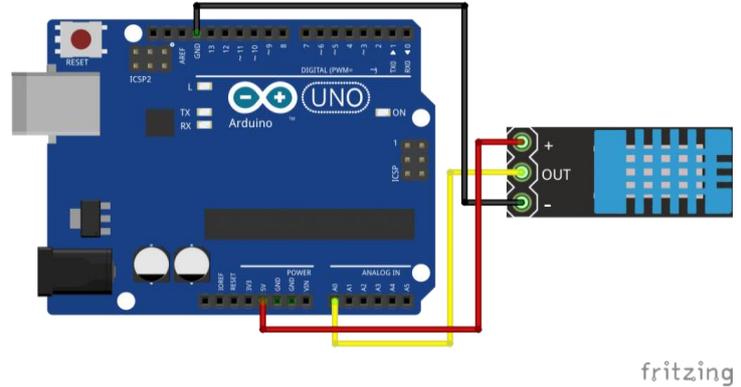
Fig. DHT11 interfacing Arduino

3. SOFTWARE DESIGN

In order to give COZMO voice instructions, the medium being used is the mobile phone's internal microphone with the help of an android application. For the purpose of taking a voice stream as an input and converting it into a string of data, we have used a software called AMR_VOICE. The interface of AMR_VOICE is given below.

Fig. AMR_VOICE Interface

This software connects to the HC-05 module with the help of Bluetooth connectivity and then transfers the voice instructions being passed to it in the form of string of data which is when decoded and processed by the micro controller to perform certain task. The voice being passed to the mobile phone is converted into string of data with the help of Google's Voice Recognition software.

4. WORKING DESCRIPTION

Here we are making use of Arduino Uno(8051) microcontroller. The LCD is being connected to the PORT-2. In 8-bit LCD, 8-data lines are being utilized. The register select is linked with the P3.7 and enable is connected to P3.6. So, whatever data is produced by the system we can have

that displayed on the screen with the help of voice instructions only. The DHT11 sensor is used to examine the temperature and humidity of the surrounding which is connected to the relative port pin. HC-05 is connected to the Pin13 for sending the message.
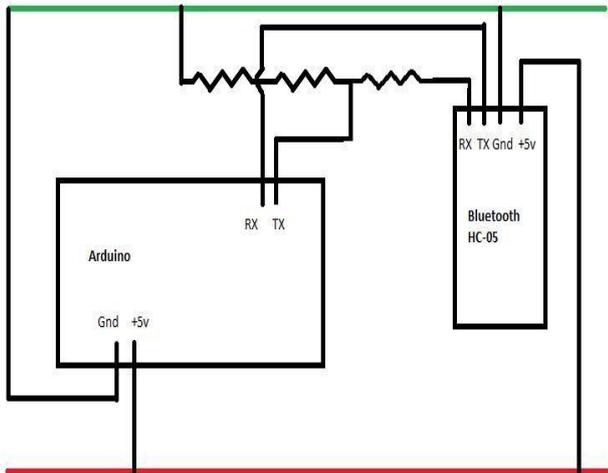
Fig. Working Of COZMO

5. RESULTS

Integration of different modules like DHT11 and HC-05 with the microcontroller provided us the way to configure our project in such a way so that it can be operated using voice instructions. The DHT11 module has proved to be useful in the determination of the real temperature and humidity of the confined area. The android application gets connected with Cozmo with the help of HC-05 and send it the voice instructions it get after converting it into string of data. That string is then transferred to the microcontroller for decoding and processing step and then the device Cozmo is instructed to perform whatever is there in the voice command. The end results are then displayed on to the screen.
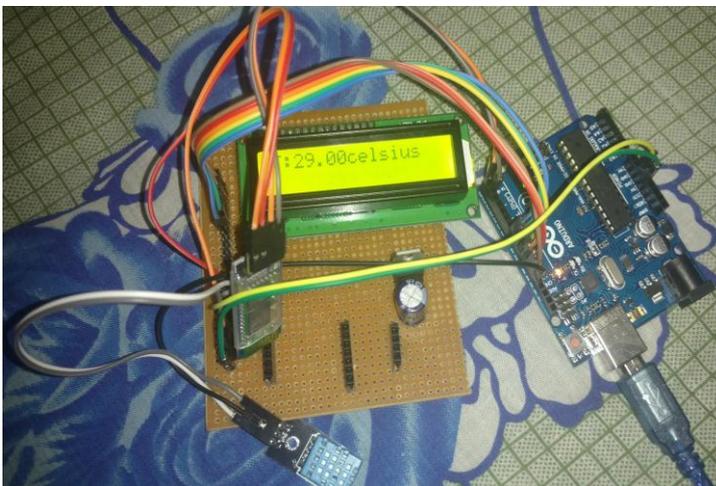
Fig. Working Cozmo

6. CONCLUSIONS

The prime objective of this project is to simplify the lives of people. Cozmo is capable of equipping the users with the information of real time, temperature and humidity with simple voice commands only. The users do not need to physically touch the device to get information out of it, when they are busy in some household chores.

Some of the areas where Cozmo lacks and need to be improved includes:

- A graphical LCD can be used to display a graph of the change of Temperature and humidity with time.

- Cozmo could be made to say the outputs which are being displayed on the screen.

- Serial output can be attached to the device so that the temperature and humidity outputs can be obtained for further analysis.

- Cozmo can be equipped further with Machine Learning algorithms so that it can be able to predict the weather conditions also.

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