SMART STICK FOR VISUALLY IMPAIRED

AIM:

To build a smart stick which assists visually impaired people finding difficulties detecting obstacles in front of them, walking in the street, which makes it dangerous.

Hardware Components:

- Arduino UNO
- Ultrasonic sensor
- Mini breadboard
- Jumper wire
- water sensor
- Buzzer
- Vibration motor
- Switch
- Stick
- A 9v battery

Project Description:

The smart stick designed will emerge as a proposed solution to enable visually impaired to identify the world around. In this, we have designed a smart stick incorporated with the ultrasonic sensors to detect any other obstacles in front of the user, within desired range. Buzzer sound and the vibration motor are activated when any obstacle is detected. This system uses the Arduino UNO, vibration motor and buzzer. The stick is capable of detecting all obstacles including water puddles and gives a warning through buzzer thereby making their travel safe. The smart stick designed is incorporated with water sensor to detect any water pits, water source or puddles and gives warning through buzzer. The buzzer signals are designed in such a way that the user can differentiate between the sounds to identify whether there is an object or watersource before him/her. The stick made is light-weight,eco-friendly and easy to carry.

Components Description:
Ultrasonic sensor : It works well for close obstacles unlike laser one.
Arduino uno : The **Arduino Uno** is an open source microcontroller board based on the microchip ATmega328P microcontroller . The board is equipped with sets of digital and analog input and output (I/O) pins that may be interfaced to various expansion board (shields) and other circuits. It is programmable with the Arduino IDE (Integrated Development Environment) via a type A or B USB cable.Arduino Uno has USB interface, 6 analog input pins, 14 I/O digital ports that are used to connect with external electronic circuits. Out of 14 I/O ports, 6 pins can be used for PWM output.
**Microcontroller ATMEGA 328P: ATMEGA328P** is high performance, low power controller from Microchip. ATMEGA328P is an 8-bit microcontroller based on AVR RISC architecture. It is the most popular of all AVR controllers as it is used in ARDUINO boards.
Water sensor : This is fitted at the bottom of the stick to sense obstacles like water pits, puddles and water spread.
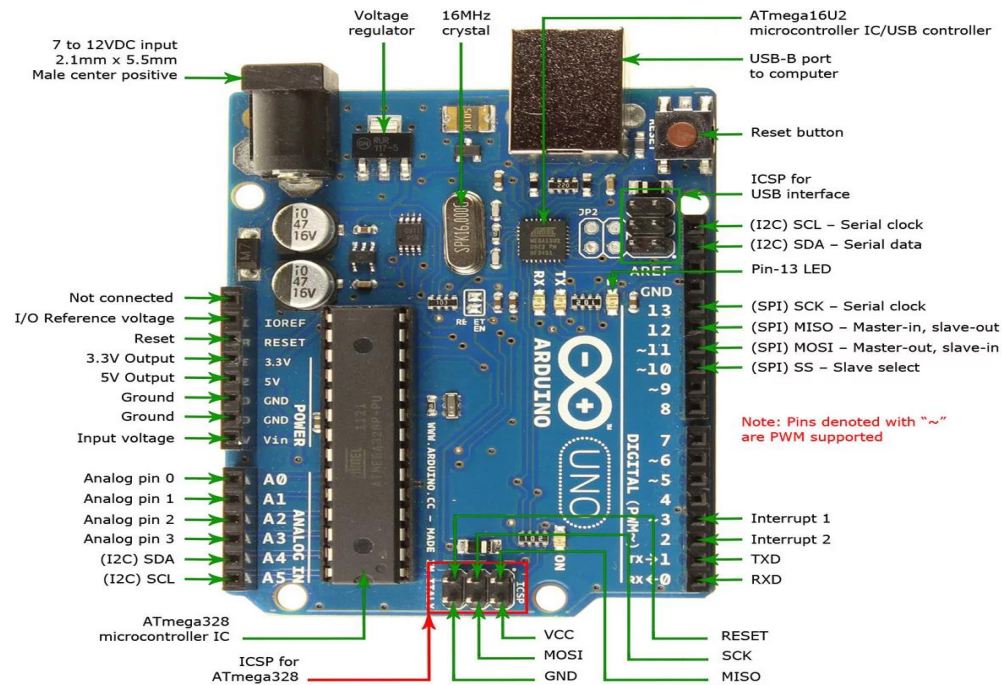**DC vibration motor :** This is the type of DC vibration motors used in mobile phones. It requires a voltage supply of 3V to 5V with current around 125 mA. The diameter of the motor is 0.5 cm and the thickness is 2.5mm.
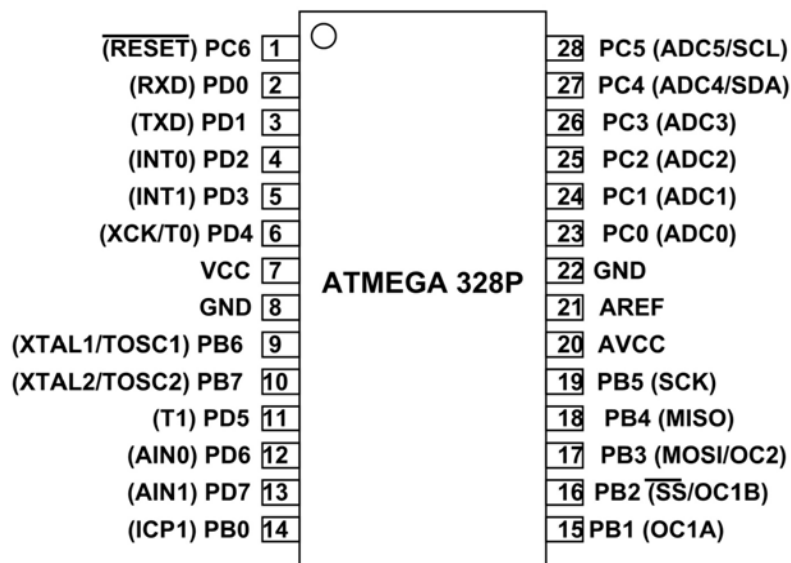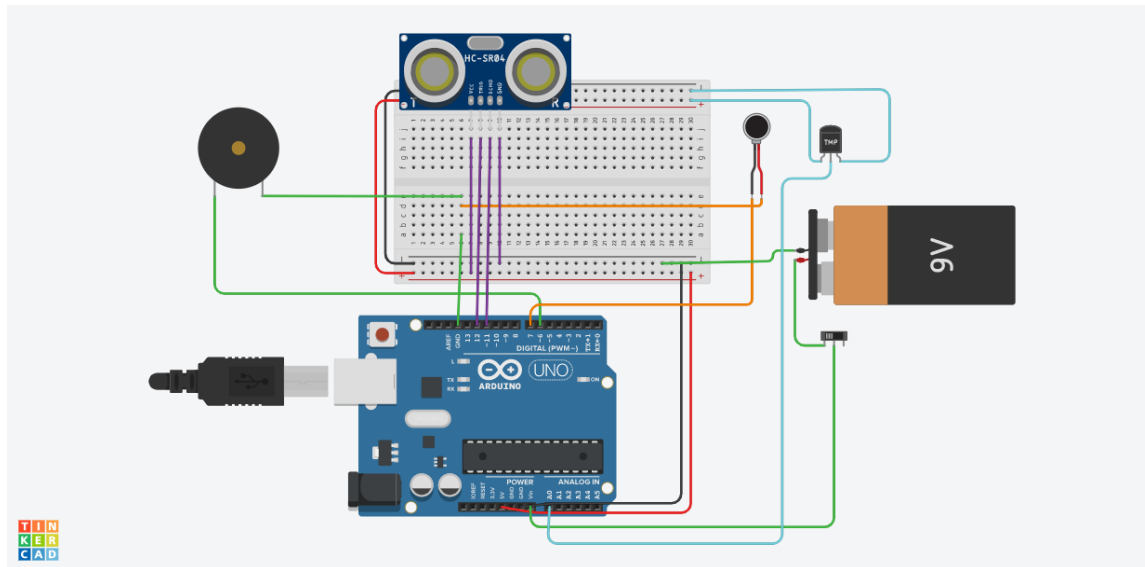
HARDWARE ARCHITECTURE:

Block diagram:
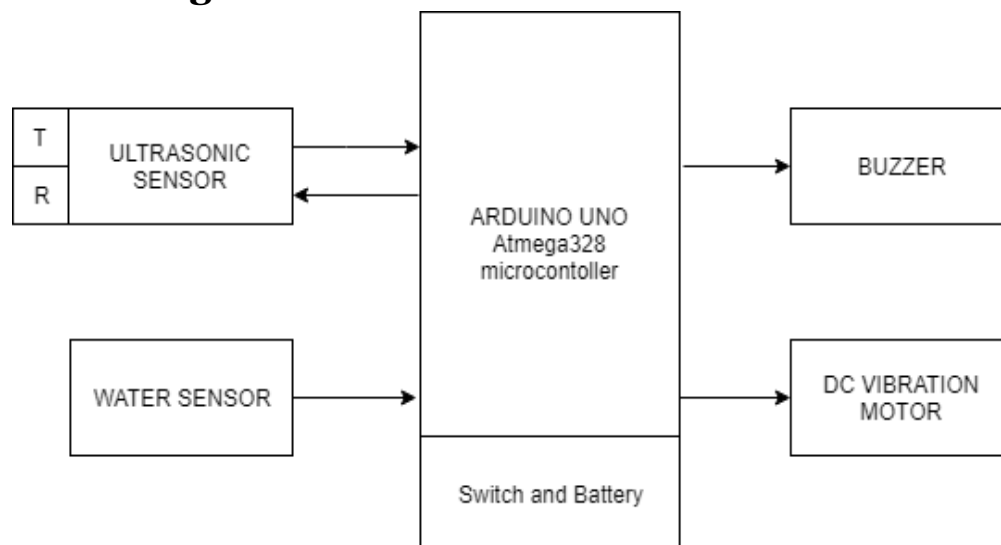
ARDUINO PIN DIAGRAM:

PIN DIAGRAM:

CIRCUIT DIAGRAM:

BUDGET:

COMPONENT	PRICE
Arduino UNO	400
Mini breadboard	70
Ultrasonic sensor	150
Water sensor	150
Jumber wire	50
Buzzer	40
9v Battery and connecter	50
Switch	10
Arduino UNO cable	100
Vibration motor	From mobile phone

Total   : 1,020