

Project Report On
“AQUA CUCKOO”



INTRODUCTION TO ENGINEERING
DESIGN – MEC 102

COURSE COORDINATOR
DR. T. VENKATESH

SUBMITTED BY
LAKSHMI SREYASHI VANAMA – 125015146
PRASEEDA KATTA – 125004196
SAI HARINI - 125157059

PROBLEM STATEMENT:

In our everyday lives we observe wastage of water in many different ways. One of those majorly found aspect is the wastage due to overflowing of tanks. The main reason for this maybe forgetting to switch off the motor at the right time.

NEED:

To overcome this problem, we need a mechanism or device which notifies the user to switch off the motor or it automatically turns off the motor.

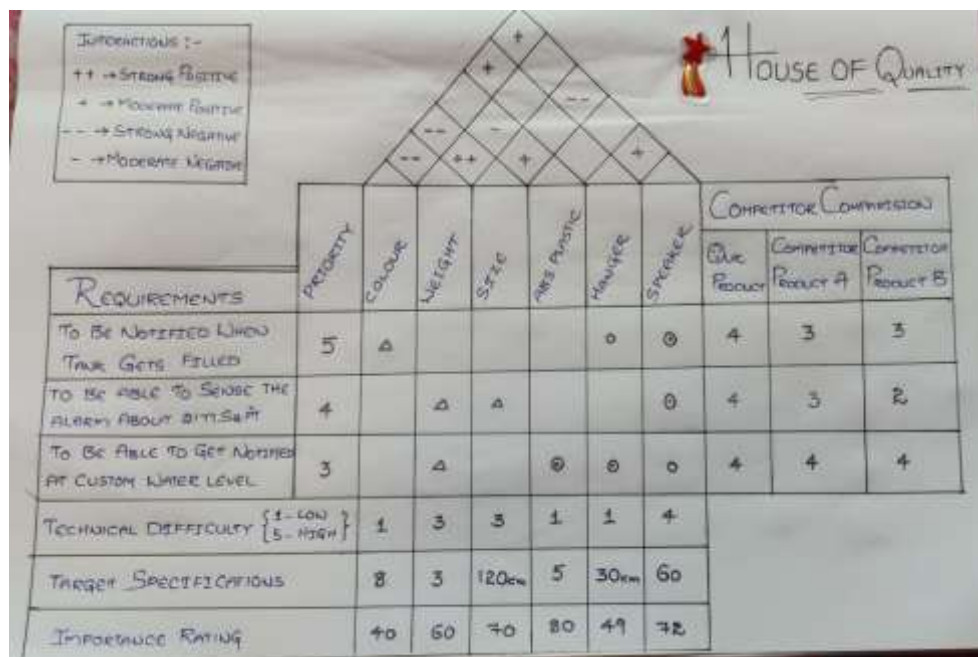
USER REQUIREMENTS:

- 1) The device should notify the user when the tank gets filled.
- 2) The user should be able to get notified even from certain distance.
- 3) The device should consume less power.

CONSTRAINTS:

- 1) The device should be water proof and shock proof.
- 2) It should be cost affordable.
- 3) It should be easy to handle and occupy less space.

HOUSE OF QUALITY:



KANO MODEL:



Must:

- Implicit and non-verbal needs are must.
- **Here must is notifying the user about filling of tank.**

Wants:

- Explicit needs are wants.
- **Here wants is to set custom water level notifying and notification comes to your mobile to turn off the motor.**

Exciters:

- Excitement leads to delight.
- **Here exciter is to add TDS meter to the product which measures the quality of water and notifies the user about when to clean the tank.**

SPECIFICATIONS:

- 1) Alarm sound can be adjusted from 85dB to 70dB
- 2) It has a measuring capacity of 150cm of water level.
- 3) Height of the product with hanger is 100cm.
- 4) Weight of the product is 1.5kg
- 5) The measuring device and hanger are detachable and foldable.
- 6) It is a blue tooth supported product.
- 7) LED Indication to show the water level in tank.



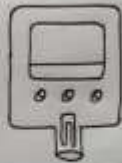





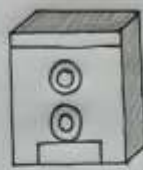


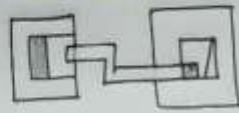
MAIN FUNCTIONS:

- To notify the user when the tank fills.
- To able to notify the user at custom water level.

SUB FUNCTIONS:

- To be able to measure the quality and mineral composition of water.
- To notify when to clean the tank.
- To be able to automatically off the motor.
- Shows the water level in the tank.

MORPHOLOGICAL CHART:

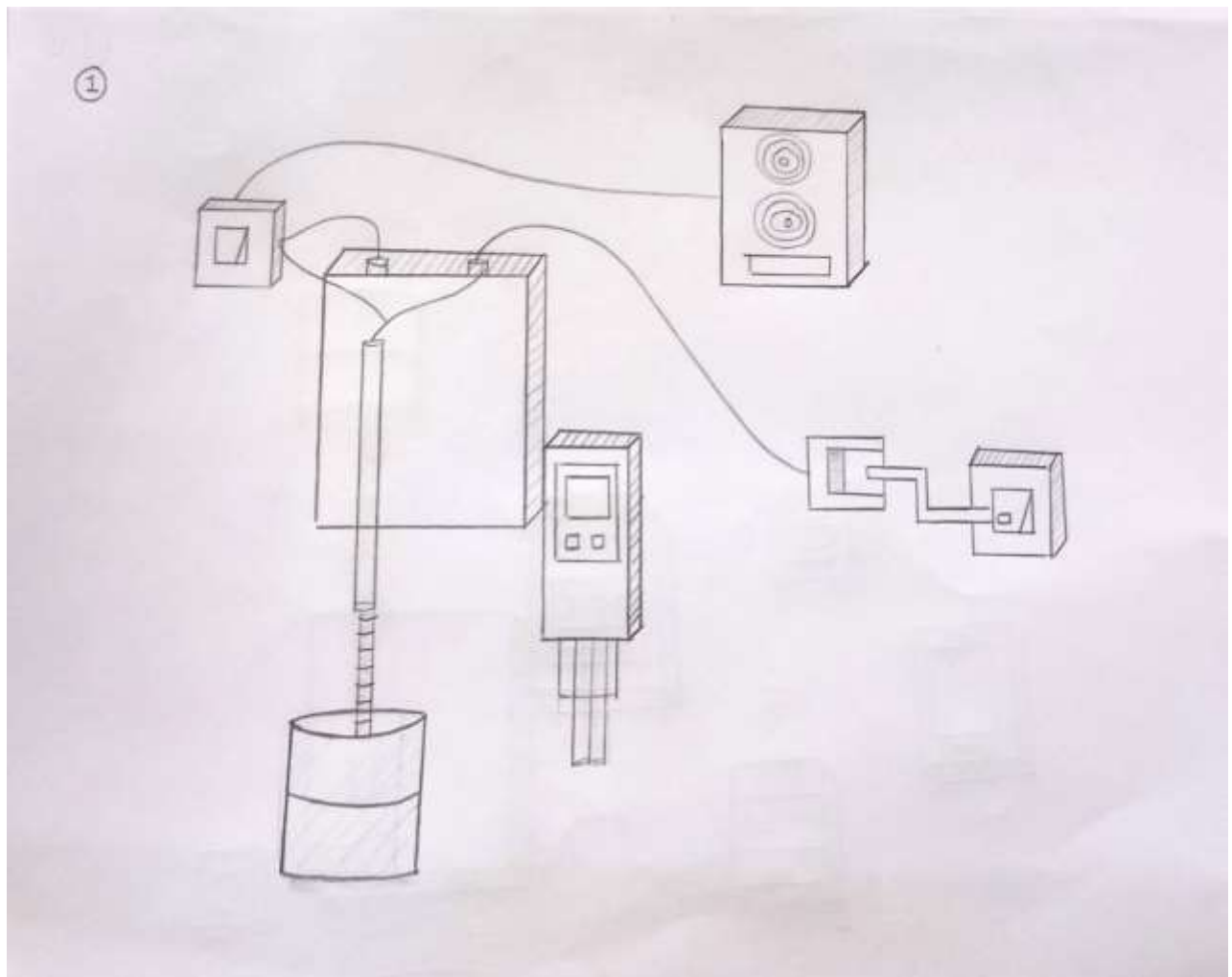
FUNCTIONS / SUB-FUNCTIONS	ALTERNATIVE - 1	ALTERNATIVE - 2	ALTERNATIVE - 3
TO BE ABLE TO MEASURE THE QUALITY AND MINERAL COMPOSITION OF WATER	 RD UNIT	 TDS METER	 MINERAL GAUGE
TO BE ABLE TO NOTIFY THE USER AT CUSTOM WATER LEVEL	 IRON SCALE	 COPPER PIPE	 STAINLESS STEEL ROD
TO NOTIFY THE USER ABOUT FILLING OF TANK.	 BELL	 MOBILE	 SPEAKER
TO BE ABLE TO AUTOMATICALLY OFF THE MOTOR	 BLUETOOTH DRIVE BT-60	 THERMOSTAT	 REMOTE SWITCH OFF

By identifying different means for a function, multiple concepts are generated using morphological chart and the best 7 concepts are considered for decision matrix and selection.

CONCEPTS

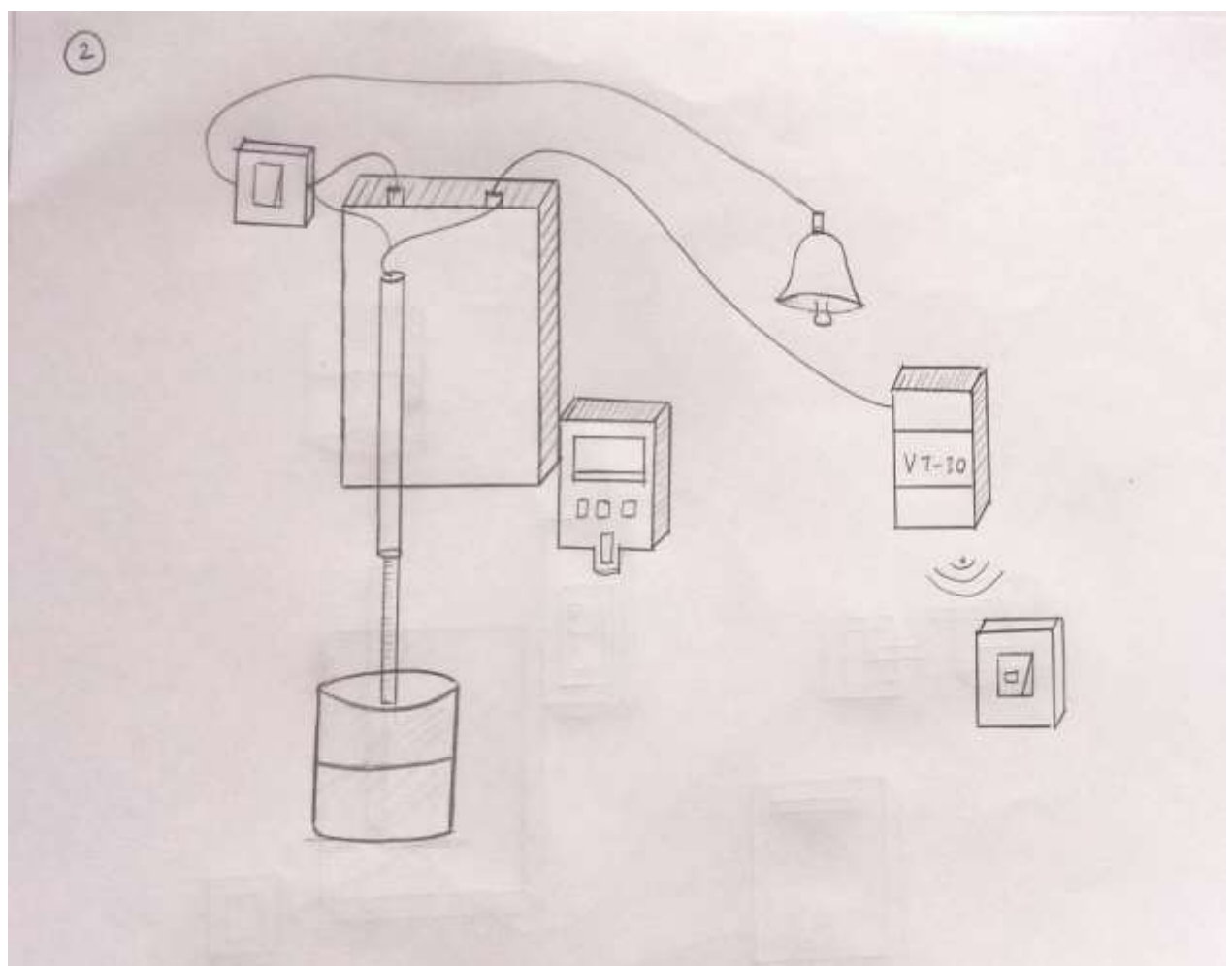
Concept-1:

- Speaker
- TDS meter
- Stainless Steel Rod
- Remote Switch off



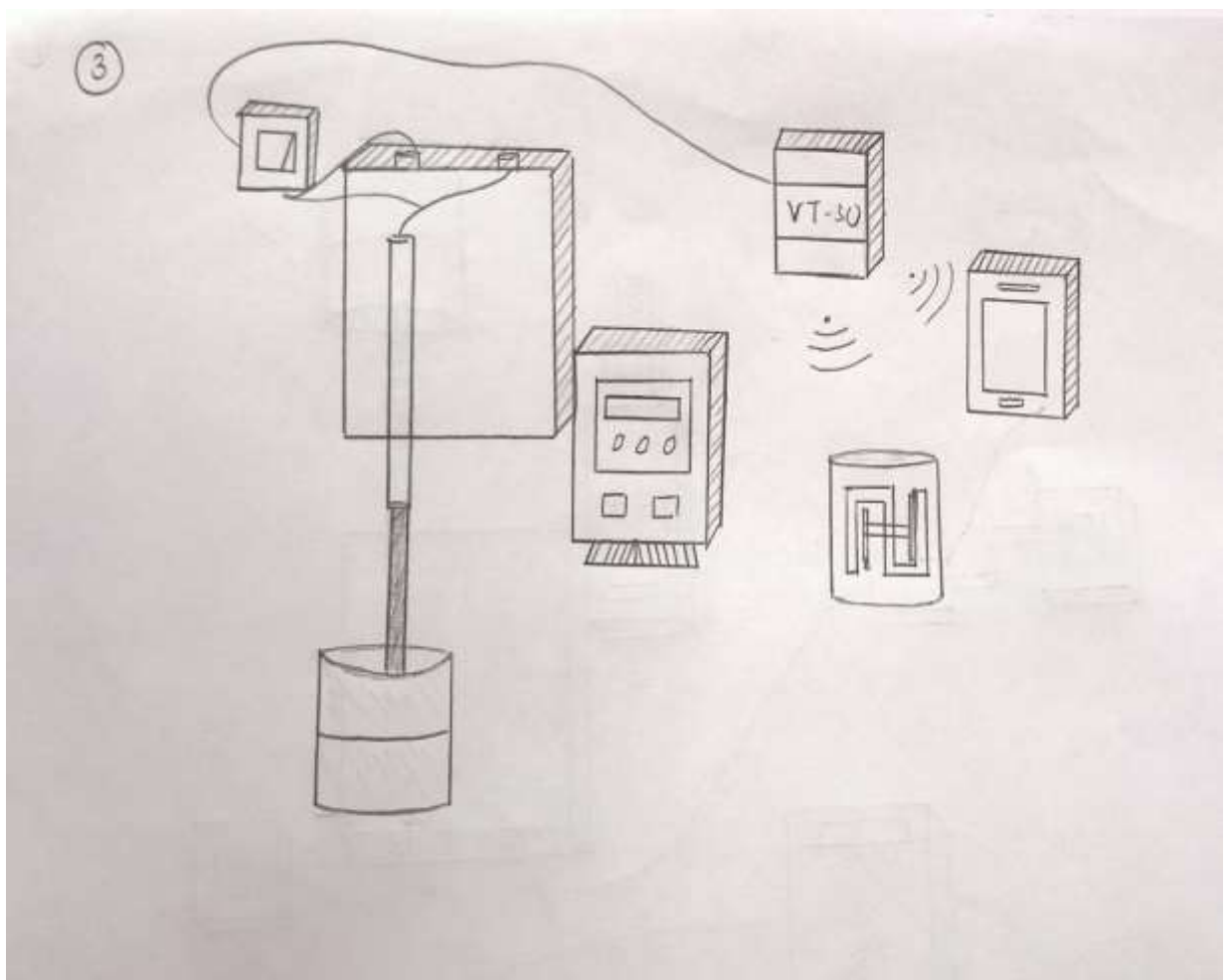
Concept-2:

- Electric bell
- Bluetooth Driver
- Mineral gauge
- Iron scale



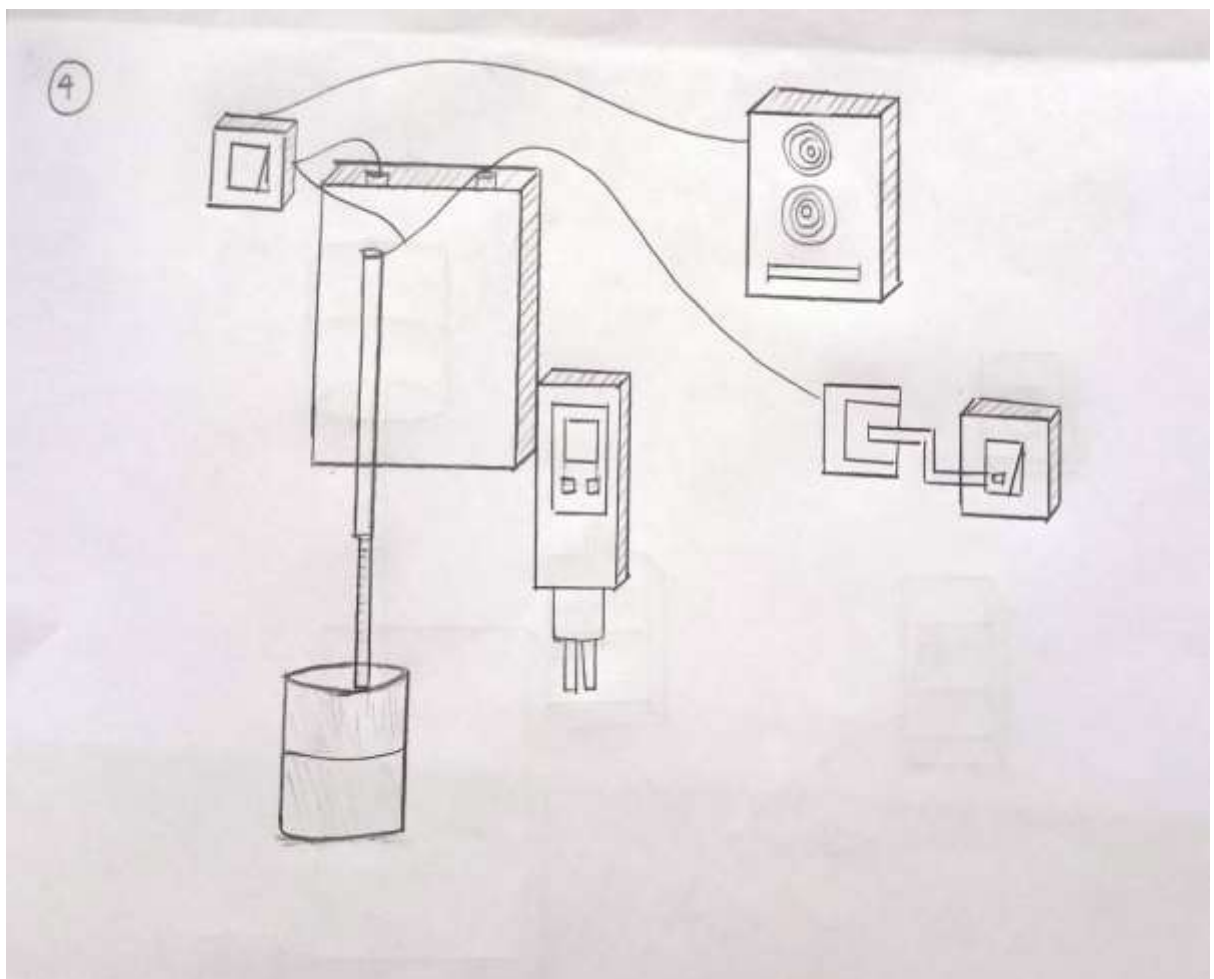
Concept – 3:

- RO meter
- Thermostat
- Mobile
- Copper pipe



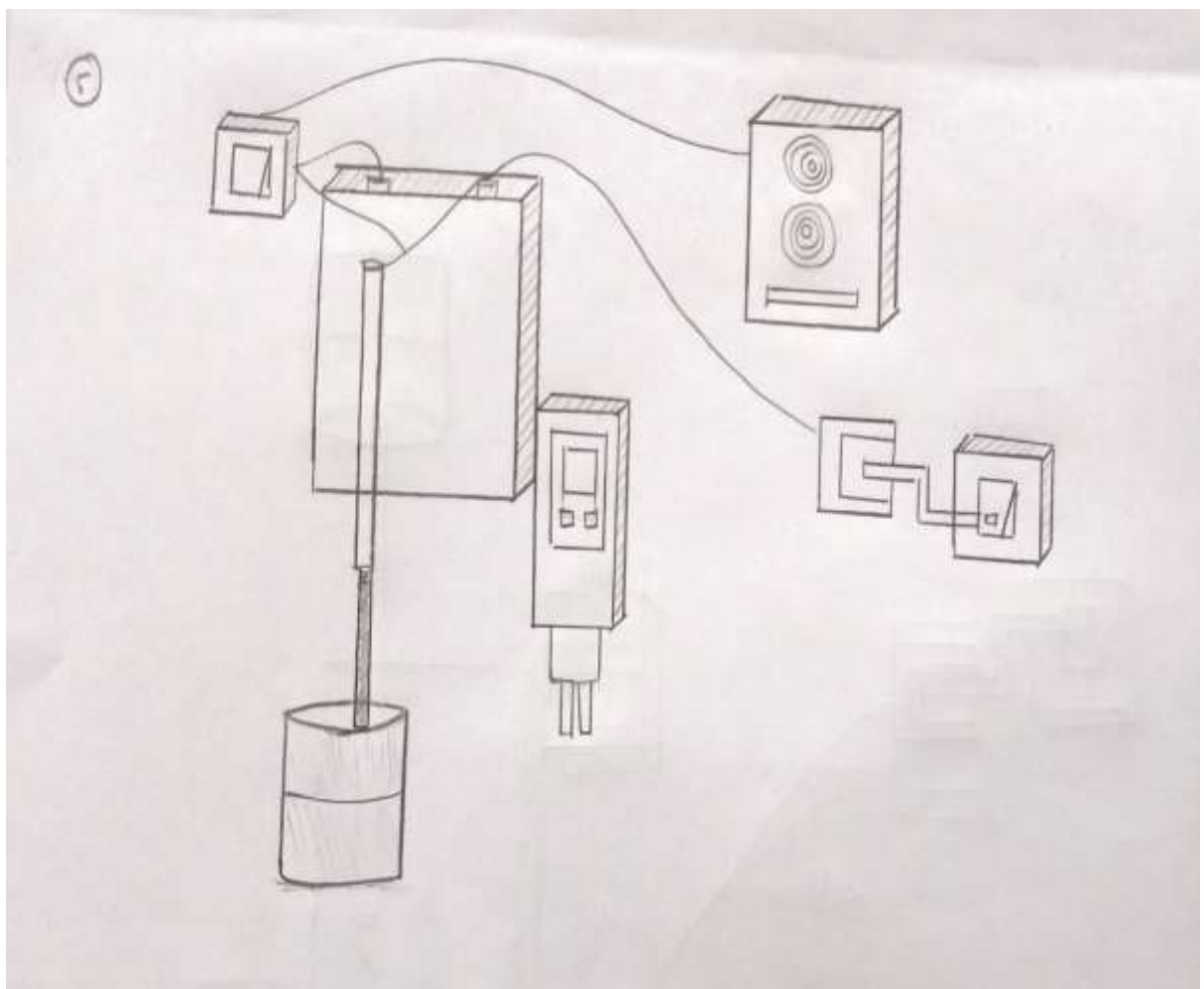
Concept – 4:

- Iron scale
- TDS meter
- Speaker
- Remote switch off



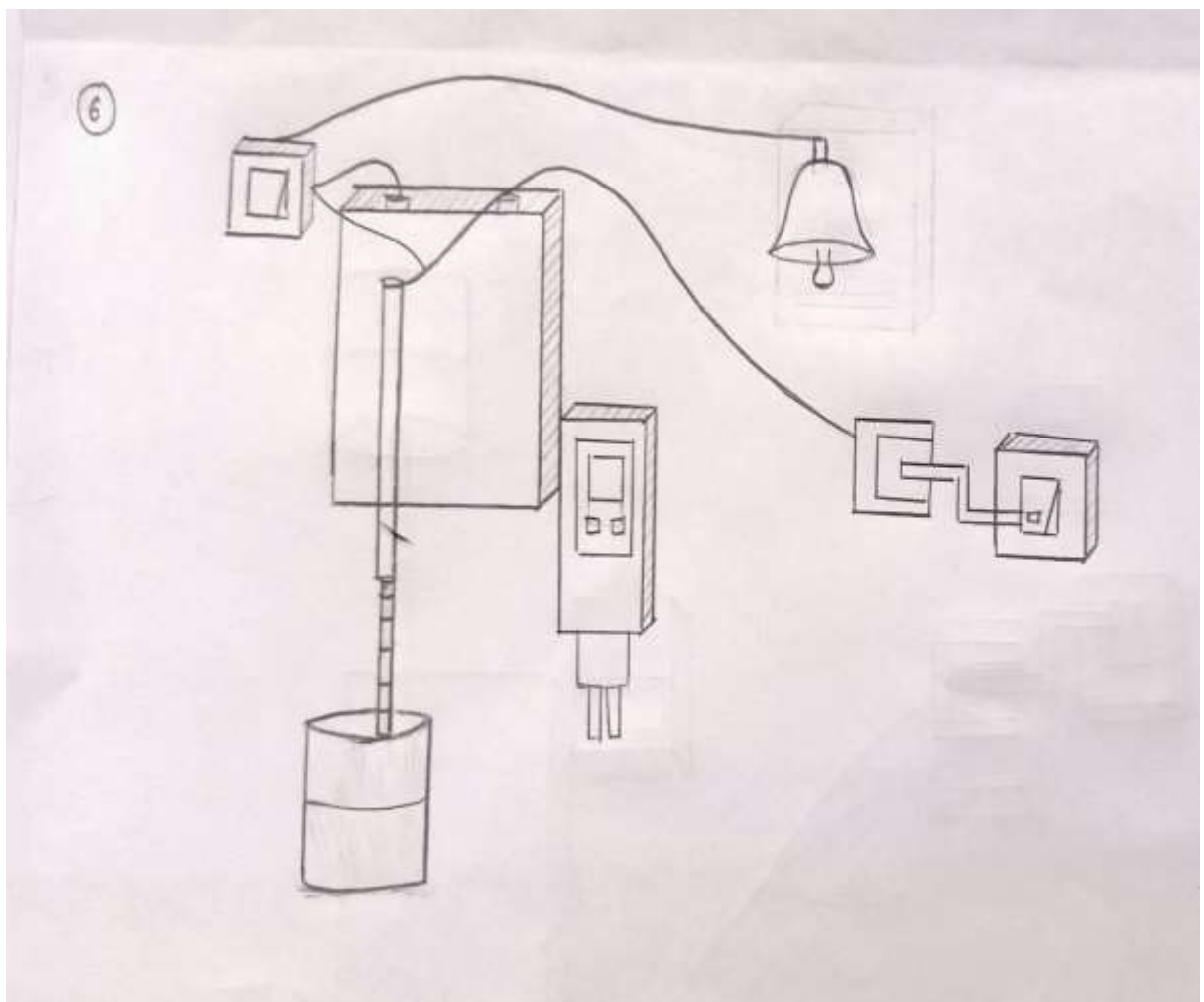
Concept – 5:

- Copper pipe
- Speaker
- TDS meter
- Remote switch off



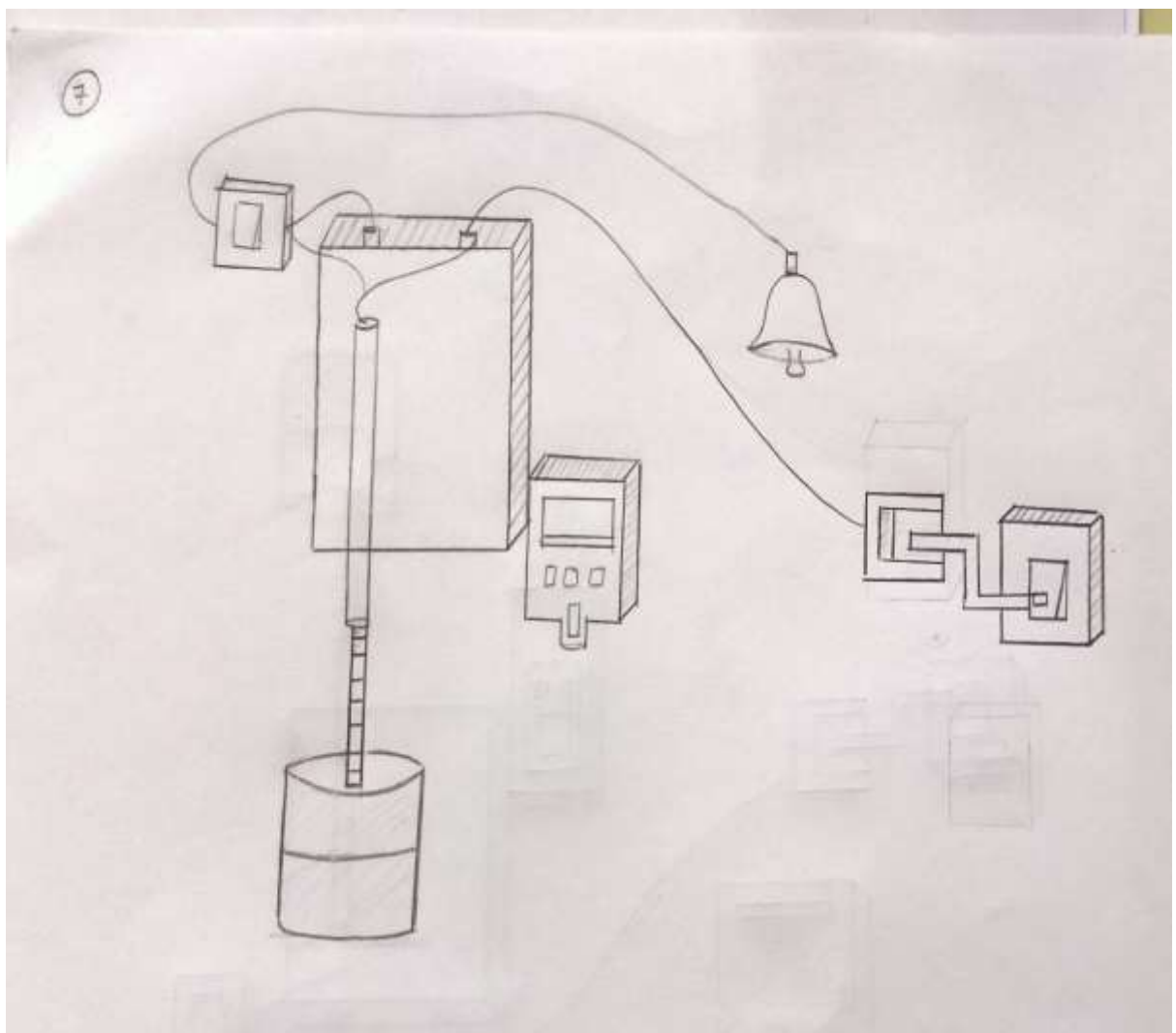
Concept – 6:

- TDS meter
- Bell
- Remote switch off
- Steel rod



Concept – 7:

- RO unit
- Remote switch off
- Electric bell
- Steel rod



DECISION MATRIX:

Concept	Cost	Availability of materials in home	Maintenance	Ease of setup	Accuracy	Total
Concept-1	9	9	8	9	9	44
Concept-2	7	6	6	8	9	36
Concept-3	8	6	6	7	8	35
Concept-4	6	7	8	7	9	37
Concept-5	5	6	7	8	9	33
Concept-6	7	8	8	6	9	38
Concept-7	7	7	7	6	9	36

Rating is given out of 10.

So, the best concept design is concept-1 backed by the analysis of decision matrix. Here the criteria of selection of the concept are based on cost, availability of materials at home, maintenance, ease of setup, accuracy.

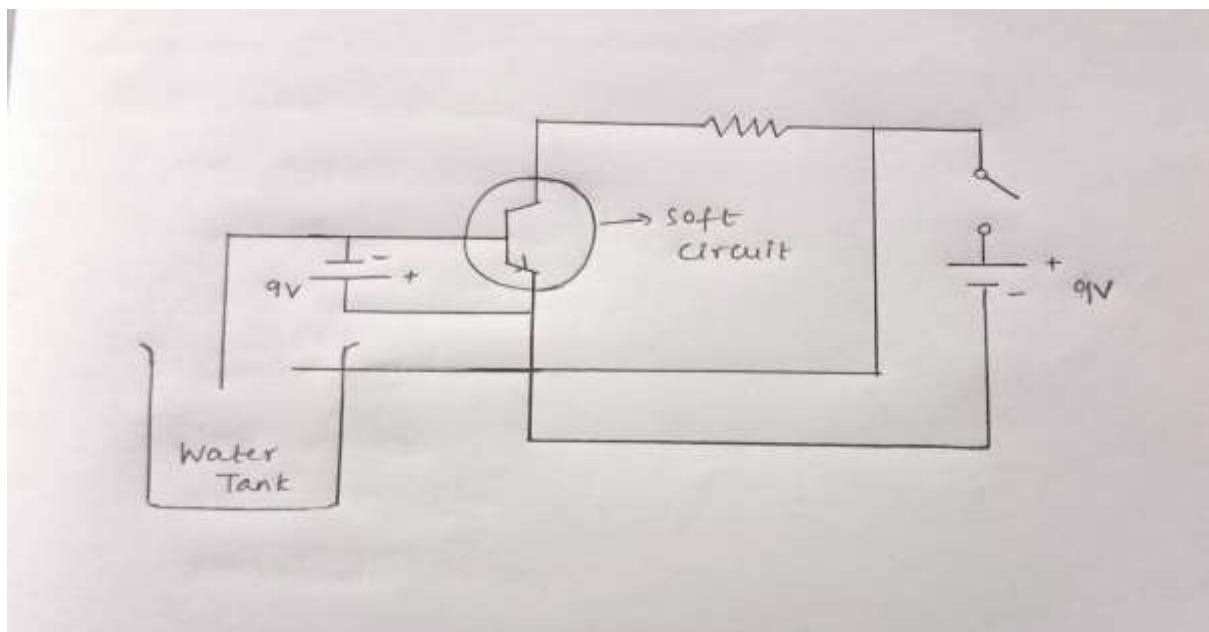
AQUA CUCKOO

This project is named after the Latin word Aqua meaning water.

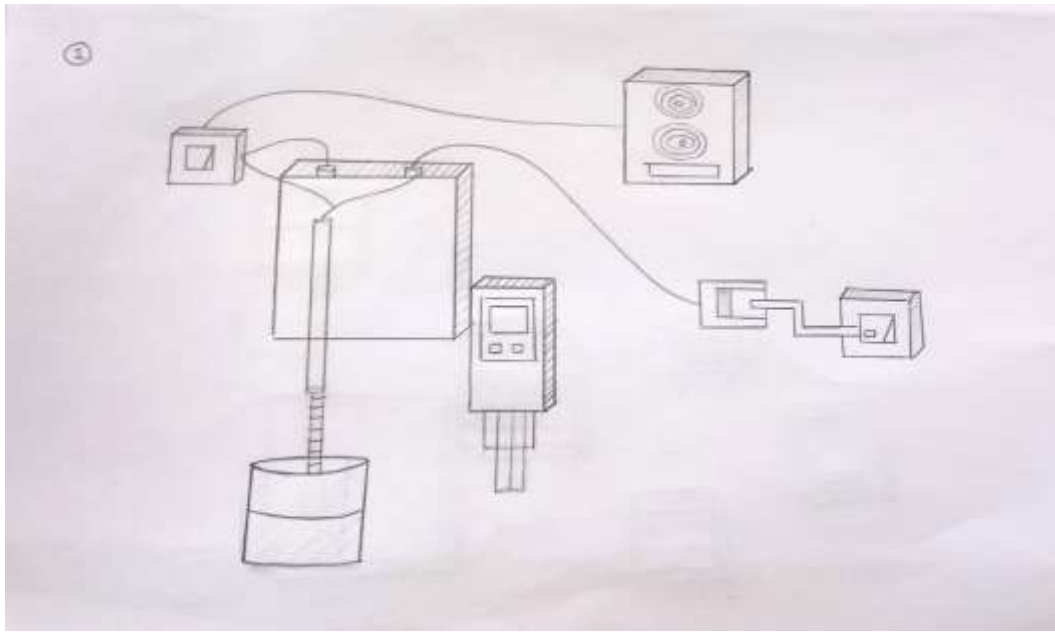
Materials Required:

- 9 v Battery
- Bottle caps-2
- Battery cap
- 2 meters copper Wires
- Switch-1
- Z shaped rod
- Soft circuit board
- ABS plastic cover
- TDS meter
- Speaker-60 dB


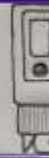
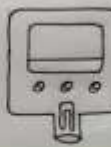





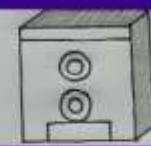


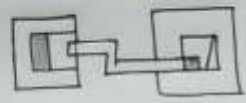
Layout:



Free hand diagram:



Morphological chart for final design:

FUNCTIONS / SUB-FUNCTIONS	ALTERNATIVE-1	ALTERNATIVE-2	ALTERNATIVE-3
TO BE ABLE TO MEASURE THE QUALITY AND MINERAL COMPOSITION OF WATER	 RD UNIT	 TDS METER	 MINERAL GAUGE
TO BE ABLE TO NOTIFY THE USER AT CUSTOM WATER LEVEL	 IRON SCALE	 COPPER PIPE	 STAINLESS STEEL ROD
TO NOTIFY THE USER ABOUT FILLING OF TANK:	 BELL	 MOBILE	 SPEAKER
TO BE ABLE TO AUTOMATICALLY OFF THE MOTOR	 BLUETOOTH DEVICE BT-60	 THERMOSTAT	 REMOTE SWITCH OFF

DESCRIPTION ON SETUP AND FEATURES OF THE PRODUCT:

- First take the 9V battery and connect one end of it to the switch then take the other end and connect it to the steel rod and cover it with the ABS plastic.
- Now take two bottle cap of same dimensions and stick both the cap in inverted way with the help of glue gun and make a hole in it according to the dimensions of the steel rod.
- Now take the positive end of the battery and connect it to the soft circuit board.
- Now take the Z-Shaped rod and connect it to the soft circuit board and attach the board beside the motor switch in a way that the rod is 90 degrees to the motor switch.
- Now take the TDS meter and attach it to the right side of the battery with glue gun. So, the product is now ready to use.
- The product works very accurately when the water starts getting filled and touches the bottle caps. Due to buoyancy force it pushes the bottles caps up so the force gets transferred to the steel rod and it also moves upward and when the rod touches free end of the switch, the circuit becomes closed electricity passes and the alarm will be started in the speaker.
- Here the TDS meter indicated the quality of water and tells us when to clean the tank.
- As the product is hanged through the help of hanger and the steel rod is also detachable and foldable, it is easy to carry and use.

THANKYOU