DIGITAL TAP

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ABSTRACT

As we know the use of wash basins at this time is still using the conventional system of using mechanical taps controlled by humans. Users also often face the problem where it is easily damaged by the negligence of other users. The tap in the public toilets used to get damage within a year. Due to this water starts leaking through the tap which leads to the wastage of water. The Automatic Digital Tap is an easy, efficient, user convenient and economical tap. Even though, the digital tap has already been implemented in the real world but this tap is an attempt to reduce the power consumption and the cost as well. The digital tap can work with a very low power supply and without any use of water pump and separate tank. The existing digital tap make use of solenoid which has only two states i.e. ON and OFF state. But our tap can also control the flow of water. Also solenoid consumes a lot of power to run. Our digital tap does not make use of any solenoid. Besides this, we use geared motor which is able to do the same task in the 5V power supply which is less than solenoid power consumption, as we are not using solenoid, it will directly effect on the cost. The cost of the existing digital tap available in the market is between Rs 3000 to Rs 12000. But the cost of our tap is just Rs 1500 with modes such as Drinking Tap mode, Toilet Tap mode, Hand washing tap mode, Watering mode and functionalities of water flow control and timer. We are also providing a feature which can sense the humidity of the soil and can water plants.

KEYWORDS

Digital tap, Hand washing tap,Flow Control, Toilet tap, Drinking Tap, Toilet Tap, Watering plants, Timer, Solenoid valve

INTRODUCTION

The water is the most precious natural resource of our environment. The automatic digital tap is an attempt to save clean water on the earth in future. The digital tap is a user convenient tap which reduces the wastage of water at different places. The major advantages of our digital tap is that it can work automatically without touching it. It can be installed anywhere. The automatic digital make use of soil humidity sensor which can sense the humidity of the plants and can supply an appropriate amount of water when they need. The system with soil humidity sensor can be used to supply the water to plants within the society and the street plants as well. There are certain

situations in which we require to control the flow of water. This service is not provided by the existing taps but our system can do this along with all the functionalities of the existing tap available in the market.

PROBLEM STATEMENT

Most of the water tap in the market usually use old system where it using manual control to turn on or turn off the system. When the users use that system they must use their hand to open or close the water tap and the water tap valve get damage easily because when the users always turn strongly to open or close the tap. This system is not efficient because water wastage easy to occur because at the time between to open the tap and wash their hand the water has already been wasted. It is same when we want to close it and if we forget to close the tap it will make waste become more critical. As we can see usage of sink only concentrate on one usage it is all about water. As technology has been rising up day by day usage of sink should not be focused on water use only because user needs something their use can give many benefit when they use it. Another disadvantages for the system is when users wash their hands, their hands not very clean because they still have a direct contact to the messy water tap where it expose to the diseases .

NEED OF DIGITAL TAP

- To save water for the future use.
- To eliminate the damage of taps specially in public areas.
- To water plants in remote areas without any need of supervision.
- To reduce bad smell in public toilets by automatic flushing.
- To reduce diseases spread by using public toilets, washrooms & drinking water taps
- To reduce wastage of water by automatically opening and closing.
- To open and close tap situated at remote location.

OBJECTIVE

The basic objective of this tap system is to conserve the water for our future and to provide comfort and convenience to customer, while using our digital tap. The customers are required to pay the cost which is almost equal to cost of the manual water taps.

The objectives of this project are:

- To change conventional water tap system and make automatic water tap.
- To reduce repair and maintenance cost spend on traditional taps mainly in public areas.
- To lessen the wastage of water that always occurs at water taps.

- To water plants when they need.
- To reduce direct contact to the tap in order to prevent from diseases.
- To control the tap from distant location using an android app.

RELATED WORK

The existing automatic taps make use of pump and external reservoir to supply water. They require high consumption of electricity, large space to install and cost more than Rs 4000. There is also low cost and less space acquiring technology which uses solenoid but the problem with the technology is that it requires high pressure of water to work which make it unsuitable to use it with drinking water tanks.

The Digital tap just requires 5V which it can easily get from battery or solar power. The digital tap have the feature to control the flow of water. Also, the cost of our tap is Rs 1500 which is almost equal to price of traditional taps.

PROPOSED METHODOLOGY

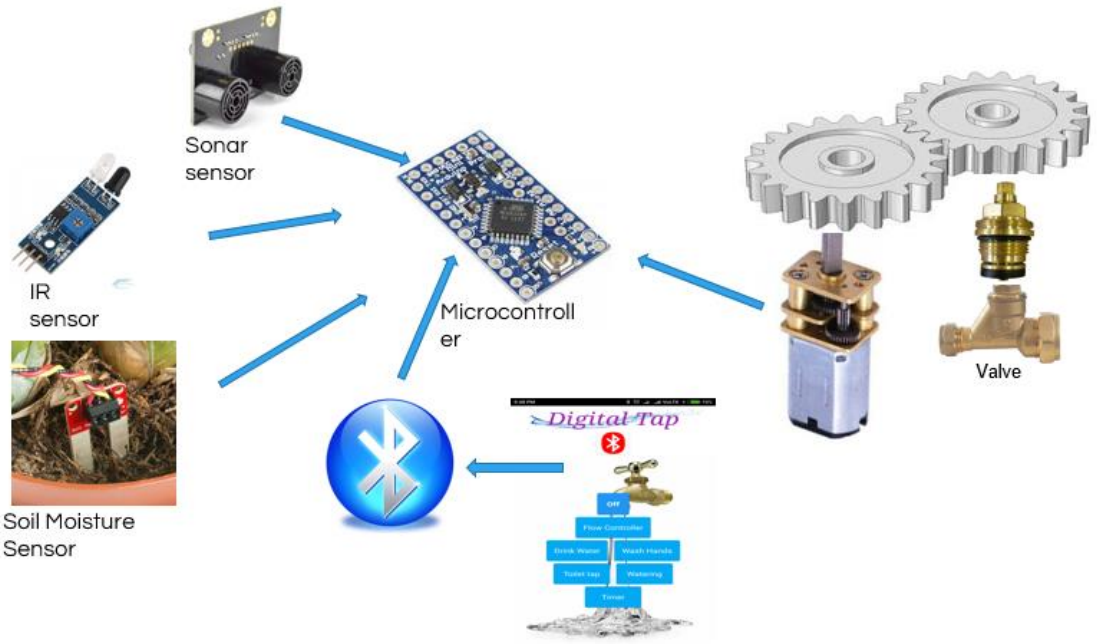
ALGORTHM:

The following algorithm gives the demonstration of the code which helps in achieving all the functionalities of digital tap.

```
void DigitalTap()
{
while(sonar_sensor()<40)
servo.write(90);

servo.write(0);

while(irsensor()>550)
servo.write(90);

servo.write(0);
}
```

The algorithm checks the value of sensors repeatedly and when it get the desired value from the sensors the servo motor rotates the value by 90 degree and makes the value open .

DESIGN:



The digital tap consist of servo motor, valve, microcontroller, ir sensor, sonar sensor, soil moisture sensor and a bluetooth module. The value and servo motor connected through gears. The servo motor can rotate to angle 0 degree to 90 degree. After getting data from different sensors, the microcontroller will send signal to servo motor. The servo starts rotating and thus rotate the shaft of valve due to which value opens and the water flow starts.

The android app is connected to microcontroller using bluetooth. It is used to switch between different modes such as Drinking Tap mode, Toilet Tap mode, Hand washing tap mode and Watering mode. Also app consist of functionality to control the flow of water and Timer to on the tap for a specific time.

PROJECT DEVELOPMENT TECHNOLOGY

The microcontroller used in Digital Tap is arduino mini pro which consist of processor ATmega328p. The sensors used are IR sensor, Sonar sensor and Soil Moisture sensor. The IR sensor is used for Drinking Water tap mode, the Sonar sensor is used for Hand washing mode and Toilet Mode and the soil moisture sensor is used for Watering Plant mode. The bluetooth module used is HC-05 for communicating between microcontroller and android application.

ON/OF

Timer

Flow Control

Drink Water mode

Toilet tap mode

Digital Tap functionalities:-

1. The device have the feature to turn on/off the flow of water.

2. The device in timer mode will turn on flow for specified period of time set by android app user

3. The flow of water can be set by using android application.

4. In Drinking mode, the device will turn on flow of water when the user will put glass or bottle down to it and will automatically turn off flow when glass or bottle is removed.

5. In Toilet Mode , the device will automatically flush the toilet when the user goes away.

6. In Hand washing mode, the device will turn on flow of water automatically when user comes near to basin and will trun off when user goes away.

7. In Watering mode, the device need to be connected to a soil humidity sensor. Using that the device will water the plant when they need.

CONCLUSION

It can be summarized that the objectives of the project are fulfilled as the Digital Tap is capable of solving problems such as wastage of water, bad smell in toilets due insufficient flushing, spread of diseases, damage of traditional taps in specially in public places, watering of plants in remote areas and wastage of energy by its functionalities.

REFERENCES

https://www.ebay.in/itm/183137180940?aff_source=Sok-Googhttps://blog.craneengineering.net/what-the-heck-is-a-solenoid-valve