IOT based automatic hand wash and water tap

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Abstract:

This project is to build and to test a tap system. The system is more advanced than the conventional hand wash and it is designed to improve life by having a more convenient hand wash system. For instance, the water, soap and dryer are integrated all into the system. The machine controls the water tap and liquid soap automatically in sequence using the arduino microcontroller. The project is using the IR sensors to detect the object placed before it. The project was created and implemented as a prototype of automatic water dispenser based on a arduino. The system uses IR sensors, arduino uno as a controller or data processor, electrically gallon pump functioned as valves open / close is driven with a DC current, Relay which serves to move the current / voltage using large current / voltage is small. The Iot based automatic tap and hand wash system is used to turn over water from source point to usage point in an efficient way and avoids human error. Automated water supply can be done through embedded system in cost effective way. The system is actually a smart system as the people who wish to wash his/her hand or drink water don't need to tum on the water tap.

Key Words: *Arduino UNO, Water Pump valve and IR sensors.*

Introduction:

Water is the available natural resources on earth, which has to be utilized efficiently. Also it has to be provided without wastage to face the problem of scarcity with appropriate quantity and quality . Water influences many areas such as agriculture field, domestic purpose, industrial usage etc. Water bodies cover 70 percent of earth surface out of this only 3 percent of water is portable and drinkable. Earth consists of 97 percent of salt water and 3 percent fresh water, so the water has to be supplied properly at appropriate time without wasting it and ensuring quality. The advanced development of science and technology upgrade the design of flow sensor and flow switch to accomplish proper distribution of water supply through water tanks and pipes. The required quantity of drinking water may vary for each and every person according to their physical activities, age, health issue and environmental based conditions. Water contributes to 60 percent and 55 percent of weight in men and women respectively. Drinking water plays an important role in human metabolism and helps in making the skin healthier, refreshed. It also makes us stay alert of many diseases. The automated. The smart tap system is used to turn over water from source point to usage point in an efficient way and avoids human error. Automated water supply can be done through embedded system in cost effective way.

System Architecture:

The system makes use of an IR sensor, water valve and relay supported by a Arduino UNO to provide access control to water valve opening and closing of the tap valve. The system consists of a hardware module and an application program for the arduino unit. The application program was developed using arduino programming language. The hardware module comprises of the input units (IR sensor, water valve and relay), the controller unit, the microcontroller unit and the power supply unit. The block diagram of the system is shown in Figure.
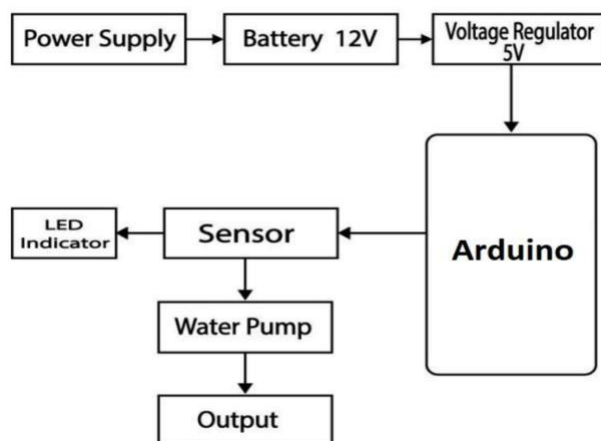

Figure : System Architecture

Data Flow Diagram:

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its process aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of process or information about whether processes will operate in sequence or in parallel.
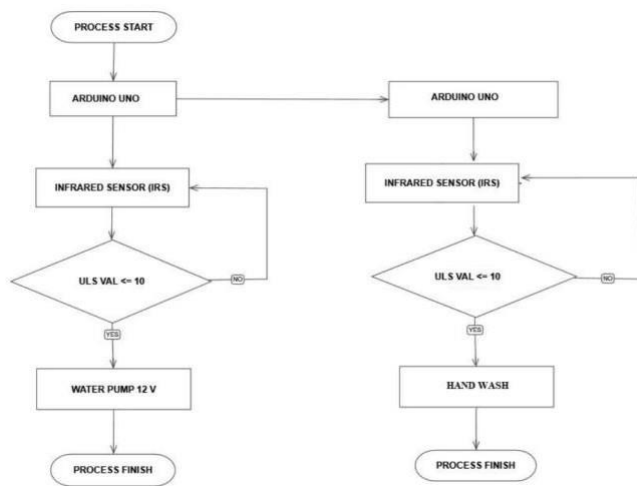

Figure : Data Flow Diagram

Sequence Diagram:

A sequence diagram is a kind of interaction diagram that shows how process operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence as shown in figures below.
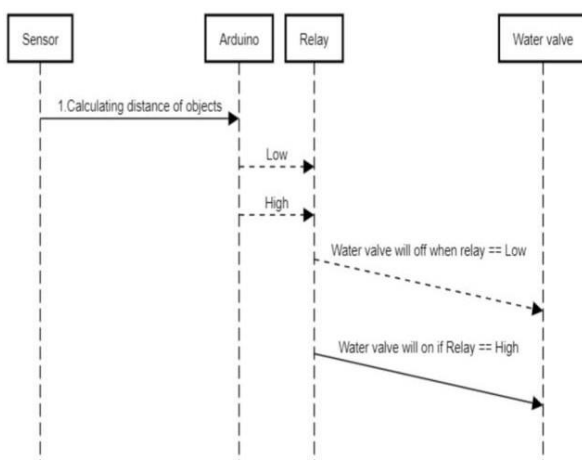

Figure : Sequence Diagram.

Activity Diagram:

Activity diagrams are graphical representation of workflows of step wise activities and actions with support for choice, iteration and concurrency. In the Figure we show the activity diagram for different modules.
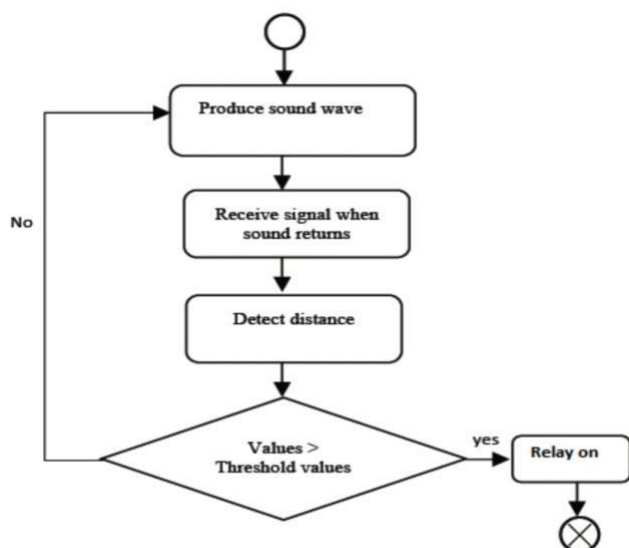

Figure : Activity Diagram.

Applications:

- School purpose
- Hospital purpose
- Public basins
- Templates

Problem Definition:

The primary schools and colleges face a lot of challenges or problems due to the diseases related to inadequate water, and hygiene which is a huge burden in developing countries. It is estimated that 88 percent of diarrheal disease is caused by unsafe water supply. Schools, particularly those in rural areas, often completely lack drinking-water and hand washing facilities; alternatively, where such facilities do exist they are often inadequate in both quality and quantity. Schools and Colleges withpoor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for Students and staff, and exacerbate Student's particular susceptibility to environmental health hazards. This project titled "IOT based Automatic hand wash and water tap" will help to wash a person's hand, drink, and in addition would save water.

Conclusion:

We have successfully studied the interfacing the IR sensor with the ARDUINO. Also, we studied the use of battery for power supply then we learn about the water valve and also studied the interfacing the water valve with the arduino.

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