Distribution of the Water in A Smart Way

Prof. **Vinod Bharat[1], Shingare Shubham[2], Dafade Jagdish[3], Khatke Renuka[4]**

[1]*Head of Computer Department,* D Y Patil School of Engineering Academy,
Ambi, Pune, *Maharashtra, India*
[234] Dept. of Computer Engineering, *D Y Patil School of Engineering Academy*
Ambi, Pune, *Maharashtra, India*

Abstract - *To develop a smart integrated system for water distribution. The distribution will be pre-scheduled and pre-intimated to the citizens over the Internet. This system makes use of electronic valves (Solenoid valve) instead of manual valves. The control of the valves will be controlled through Mobile App as per schedule and will be notified in advance to the citizens of specific area through the Internet or SMS So that the wastage of water can be prevented. Indian Government decided to build 100 new Smart City. This Project (Smart Water Distribution System) will perfectly fit to it as it is Smart-Distribution Controlled through the mobile app or Desktop Application which can be handled through anywhere from city by Water Distributor. Pre intimated of the water distribution will save both Time and Water*

*Key Words***: Microcontroller, Solenoid Valve, Ethernet Shield, Internet Connection, Mobile or Desktop App, Server, Wireless Network**

1. INTRODUCTION:

Current traditional water distribution system requires more manpower and may cause wastage of water, because the distribution is not pre-intimated or pre-planned. This manual distribution of water by opening and closing valves on roads may cause accidents and is more time consuming. As it requires more manpower, it is also not cost effective. Also traditional system did not maintain any record related to distribution time or amount of water to be distributed.

1.1 Goals and Objectives :

Main Goals and Objectives of the System are:

- Current water distribution system is manual way, we are making it automated.
- There are open pits everywhere on roads where valves are located, as we are using
- Solenoid valves, it doesn't require open pits. Open pits may cause accidents.
- More manpower required in traditional water distribution, in our system only one person can control whole system.
- No schedule or intimation to the people before delivering water in current system, it may cause wastage of water. Schedule will be given in advance to the people so time and water can be saved.
- Implementation of equitable water supply scheme.

- Maintain all record of distributed water like time and amount of water to be distributed.

2. SYSTEM DESCRIPTION:

Firstly we give command through web-application or android app then this will transfer to particular micro-controller and then microcontroller identify the command then send this command to valve and the valve is ON/OFF.

- **Front End:** In Front End we design dynamic website using HTML, PHP, Bootstrap, JAVA, CSS, JavaScript
- **Back End:** In Back End we are using MySQL for database, PHP, JavaScript, ARDUINO Board Coding.
- **Input:** Area Name is the input.
- **Output:** Valve ON/OFF that given area.
- **Success Conditions:** Valve will work according to given command.
- **Failure Conditions:** Valve will not work according to given command.
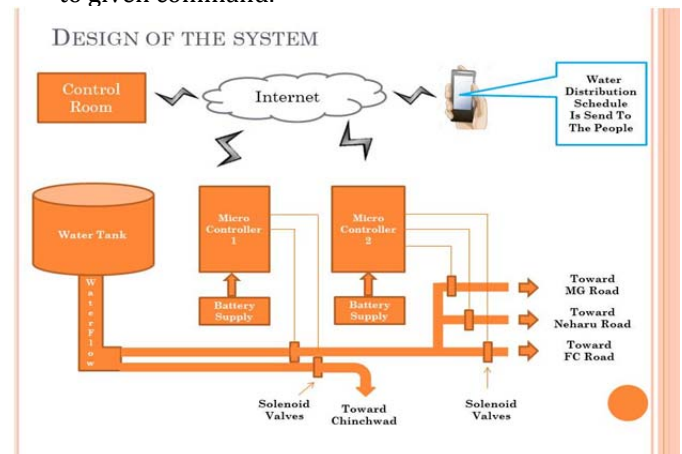
Require hardware:

Following Hardware are require
1. Solenoid Valve
2. Ethernet Shield/WIFI Shield
3. ARDUINO Board

2.1 Solenoid Valve:

For controlling the flow of water we use SOLENOIDE VALVE. These are normally closed water/air solenoid valves (Opens when energized) This type of water/air solenoid valves are used as inlet (feed) valves in washing machines, water purifiers, dish washers, Ice makers, vending machines, Coffee makers and as control valve in Automatic Water Faucets (Automatic

sensor Taps). And anywhere where water/air is need to be controlled by solenoid valve. Pilot operated diaphragm water/air solenoid valves are available in various models and specifications.


Figure 1: Water Solenoid valve 1/2" x 1/2"

2.2 ARDUINO Board:

In This Project we use ARDUINO Uno board for handling the Solenoid Valve. ARDUINO Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without working too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of ARDUINO Software (IDE) 1.0. The Uno board and version 1.0 of ARDUINO Software (IDE) were the reference versions of ARDUINO, now evolved to newer releases. The Uno board is the first in a series of USB ARDUINO boards, and the reference model for the ARDUINO platform; for an extensive list of current, past or outdated boards see the ARDUINO index of boards.
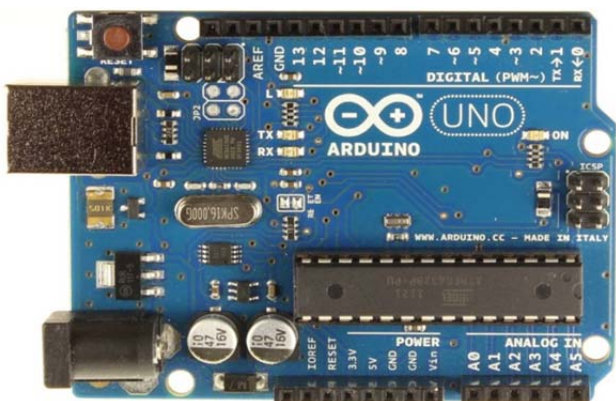
Figure 2: Ethernet Shield Front
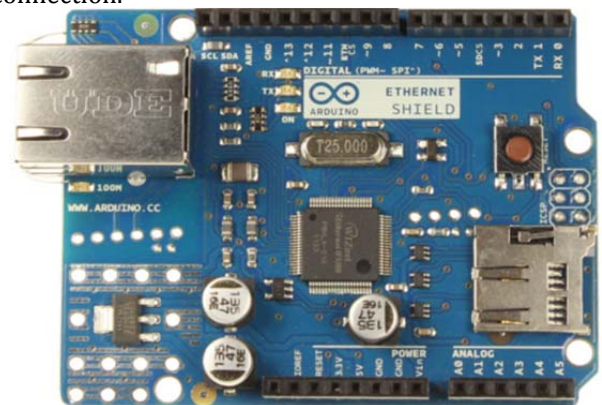
2.3 Ethernet Shield/WiFi Shield:

The ARDUINO Ethernet Shield allows an ARDUINO board to connect to the internet. It is based on the WIZNET W5100 Ethernet chip (datasheet). The WIZNET W5100 provides a network (IP) stack capable of both TCP and UDP.

It supports up to four simultaneous socket connections. Use the Ethernet library to write sketches which connect to the internet using the shield. The Ethernet shield connects to an ARDUINO board using long wire-wrap headers which extend through the shield. This keeps the pin layout intact and allows another shield to be stacked on top.

The Ethernet Shield has a standard RJ-45 connection, with an integrated line transformer and Power over Ethernet enabled.

There is an onboard micro-SD card slot, which can be used to store files for serving over the network. It is compatible with all the ARDUINO boards. The on-board micro SD card reader is accessible through the SD Library. When working with this library, SS is on Pin 4. The original revision of the shield contained a full-size SD card slot; this is not supported.

The shield also includes a reset controller, to ensure that the W5100 Ethernet module is properly reset on power-up. Previous revisions of the shield were not compatible with the Mega and need to be manually reset after power-up. We will use this for internet connection.

Figure 3: Ethernet Shield Front
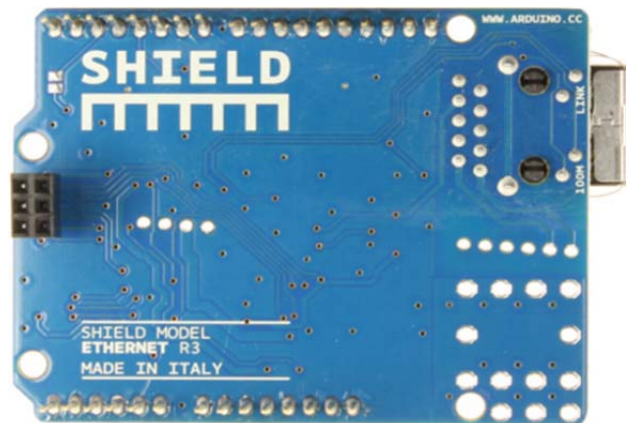
Figure 4: Ethernet Shield Back

3. CONCLUSIONS:

In this project we develop a smart water DISTRIBUTION system. It is more efficient and more reliable than old method. In traditional day the more manpower are required but using this system we require less manpower. It also prevents road accident. It saves the wastage of water.

ACKNOWLEDGEMENT:

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