PROJECT: SMART WATER FOUNTAIN
PHASE-1:

PROJECT OBJECTIVES:

There are many benefits to using IoT in water quality monitoring. For instance, it can help save money on water treatment and pumping costs. Additionally, it can improve the efficiency of water distribution, leading to less water waste and lower energy bills. In addition, IoT can provide real-time data on water quality, allowing for more timely interventions when problems are detected. This can lead to improved public health and safety, as well as reduced environmental impacts from water contamination. Finally, deploying IoT in water quality monitoring can help build public trust in the government and utilities that manage our water resources. Some potential issues that may arise when integrating IoT technology into the water management process include:

A. Public water governance companies may be concerned about the cost of implementing and maintaining an IoT system.

B. Privacy and ownership of data: There may be concerns regarding who owns and protects the data collected by IoT sensors

C. There may be challenges in integrating the IoT system with the water governance company's existing systems and processes.

D. Water management may be subject to regulatory challenges or concerns related to IoT technology.

Another is the communication and networking infrastructure that will be used to transmit data from the sensors to a central server or cloud service. This may include the use of wireless technologies such as WiFi, Bluetooth or cellular, as well as wired connections. The software and algorithms used to process and analyze the data collected by the sensors will be an important part of the IoT system. This may include the use of machine learning algorithms to identify trends and patterns in the data.

IOT Sensors Design:

Temperature Sensor: A water-proof temperature sensor is going to be used. Part number from sparkfun is: DS18B20 [6]. This temperature sensor is compatible with a relatively wide range of power supply from 3.0V to 5.5V. The measured temperature ranges from -55 to +125 celsius degrees. Between -10 to + 85 degrees, the accuracy is up to +-0.5 degrees. This sensor can fulfill all requirements needed for this project.

PH-sensor: PH value is a valued indicator of water quality. This PH-sensor works with 5V voltage, which is also compatible with the temperature sensor. It can 6measure the PH value from 0 to 14 with an accuracy of +- 0.1 at the temperature of 25 degrees.

Liquid Level Sensor: This sensor is responsible for reflecting how much freshwater is left in the water tank. When the water level is low, fresh water will be pumped to the water tank to ensure the water fountain keeps running with freshwater. This sensor is 0.5 Watts. For water level from 0 to 9 inches, the corresponding sensor outputs readings from 0 to 1.6. From that, the quantity of freshwater left can be determined

INTEGRATION APPROACH:

Our goal is to design a smart water fountain that can monitor the water quality and automatically replace water when polluted(not healthy) or running out. We will use sensors to measure the water quality. Common water quality measurement factors include temperature, Ph-value, conductance, turbidity and hardness [3]. Considering the pollution at home can only affect limited factors, we choose temperature, Ph-value and conductance to be the three properties used for calculating water quality in our water fountain. These data will be collected, calculated, and reflected to the user in terms of "Good", "Average" and "Bad".