**Phase 2 : INNOVATION**

**(Smart Water fountain)**

**Project Overview:**

Design a smart water fountain with features like user interaction and real-time monitoring. The project aims to promote water conservation and offer a modern, interactive experience.

**Components and Materials:**

1. Water Dispensing Mechanism:
   * Submersible Water Pump
   * Water reservoir
   * Actuators. Smart water fountains can use a variety of actuators to control their operation. This may include pumps, valves, and lights. The choice of actuators will depend on the specific features that the fountain needs to support.
2. Sensors:
   * Flow rate and pressure sensor (to monitor water characteristics).
   * Water Level Sensor (to monitor water levels)
   * Temperature and Humidity Sensor (to monitor quality of water).
3. Microcontroller:
   * Arduino, Raspberry Pi, or a similar platform
4. User Interface:

This allows users to interact with the fountain and change its settings. This user interface can be implemented by a mobile app.

1. Connectivity:
   * Wi-Fi module (e.g., ESP8266) for remote monitoring and control
   * Bluetooth for local control via a smartphone app
2. Power Supply:
   * 5V power source for the pump and sensors

**Design Steps:**

1. Build the Fountain Structure:
   * Design and assemble the physical structure of the water fountain, incorporating the water reservoir, pump, and dispensing nozzle.
2. Assemble the Electronics:
   * Connect the water pump to the microcontroller and power supply.
   * Install the sensors.
   * Connect the display and user interface components to the microcontroller.
3. Write Software:
   * Develop the firmware for the microcontroller. This includes:
     + Code to monitor water levels and dispense water when the level is low.
     + Logic to control the pump and sensors.
     + Code to display water level, temperature, and other relevant data on the touchscreen or to the personal user.
     + Implement user interaction and control functions (e.g., dispensing on demand, adjusting settings).
     + Set up Wi-Fi connectivity for remote monitoring and control.
4. User Interface Design:
   * Design a user-friendly interface on the touchscreen. Include options for adjusting water temperature and monitoring water levels.
5. Wireless Connectivity:
   * Configure the Wi-Fi module to connect the fountain to a local network or the internet. Develop a simple web-based dashboard to remotely control and monitor the fountain.
6. Testing and Debugging:
   * Thoroughly test the smart water fountain to ensure it operates as intended. Debug any issues that arise during testing.

This design serves as a starting point. Depending on the project's complexity and available resources, further enhancement and customisation can be made.

**Innovations:**

* The HydrateSmart Water Station is a smart water fountain that uses sensors to track the user's water consumption and preferences. The fountain can also dispense flavoured water and sparkling water.
* The WaterDrop Smart Water Fountain is a smart water fountain that uses a water purification system to ensure that the water is safe to drink. The fountain also has a built-in UV lamp to kill bacteria.
* The Smart Water Fountain by Quench is a smart water fountain that uses real-time water quality monitoring sensors to detect contaminants such as bacteria, viruses, and chemicals. The fountain also has a built-in filter to remove contaminants from the water.

As smart water fountain technology continues to develop, we can expect to see even more innovative and transformative uses for smart water fountains in the future. For further development these innovations can also incorporated in our project.

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