Phase 4: Development Part 2 - Smart Water Fountain

I. Introduction

In Phase 4, the development of the Smart Water Fountain project continues with a focus on creating a data-sharing platform. This platform is designed to display real-time water consumption data obtained from the IoT sensors embedded in the smart water fountains. The goal is not only to provide users with insights into water usage but also to actively promote water conservation efforts through an engaging and user-friendly interface.

II. Platform Development Overview

The data-sharing platform will be built using web development technologies, including HTML, CSS, and JavaScript. The platform will feature real-time data display, interactive elements, and prompts to encourage users to adopt water conservation practices.

III. Platform Features

Real-time Data Display:

Develop a dynamic dashboard that displays real-time water consumption data from smart water fountains.

Utilize JavaScript and AJAX for asynchronous data updates to ensure users receive the latest information.

User-friendly Interface:

Design an intuitive and visually appealing interface for easy user navigation.

Ensure a responsive layout that adapts to various devices, promoting accessibility.

Interactive Elements:

Implement interactive charts and graphs to visualize water consumption trends.

Provide user-friendly controls, such as sliders or buttons, allowing users to customize their data views.

Promotion of Water Conservation:

Integrate features that actively encourage water conservation efforts.

Display conservation tips, challenges, or achievements related to water usage.

Implement dynamic prompts or notifications to engage users in adopting water-saving practices.

IV. Development Steps

HTML Structure:

Create the HTML structure for the platform, including header, navigation, and main content sections.

Include placeholders for real-time data visualization elements.

CSS Styling:

Apply CSS styling to enhance the visual appeal and responsiveness of the platform.

Ensure a user-friendly and consistent design across various screen sizes.

JavaScript Functionality:

Develop JavaScript functions for fetching real-time data from IoT sensors using AJAX.

Implement dynamic updates to the platform to reflect the latest water consumption information.

Chart and Graph Integration:

Integrate JavaScript charting libraries to visually represent water consumption data.

Customize the charts to provide meaningful insights to users.

User Interaction Features:

Implement interactive elements, such as buttons or sliders, for users to customize their data views.

Include features allowing users to set personalized water usage goals.

Water Conservation Prompts:

Design and integrate prompts or notifications that actively encourage water conservation.

Utilize JavaScript to trigger these prompts based on user behavior or specific data thresholds.

V. Conclusion

The development of the data-sharing platform represents a critical step in enhancing the Smart Water Fountain project. This platform aims to empower users with real-time insights into water consumption while fostering a culture of water conservation.

VI. Next Steps

Subsequent phases will focus on testing, optimization, and the integration of additional features. Stay tuned for further updates on the progress of our Smart Water Fountain project.

HTML code

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Smart Water Fountain - Data Sharing Platform</title>
    <script src="https://code.jquery.com/jquery-3.6.4.min.js"></script>
    <script src="https://cdn.jsdelivr.net/npm/chart.js"></script>
    <link rel="stylesheet" href="styles.css">
</head>

<body>
    <header>
        <h1>Smart Water Fountain Dashboard</h1>
    </header>
    <main>
        <div id="dataDashboard">
            <!-- Real-time data visualization elements will be dynamically added here -->
            <canvas id="waterChart" width="400" height="200"></canvas>
        </div>
    </main>
    <script src="script.js"></script>
</body>

</html>
```

CSS styling

```
body {
    font-family: 'Arial', sans-serif;
    margin: 0;
    padding: 0;
}

header {
    background-color: #007BFF;
    color: #FFF;
    padding: 1em;
    text-align: center;
}

main {
    padding: 1em;
}

#dataDashboard {
    margin-top: 1em;
}
```

JavaScript Functionality (script.js):

```
$(document).ready(function () {
  function fetchWaterData() {
    // Simulated data for demonstration purposes
    const data = [20, 25, 18, 22, 30, 28];

    updateDataDashboard(data);
  }

  function updateDataDashboard(data) {
    const ctx = document.getElementById('waterChart').getContext('2d');
    const waterChart = new Chart(ctx, {
      type: 'line',
      data: {
        labels: ['Time1', 'Time2', 'Time3', 'Time4', 'Time5', 'Time6'],
        datasets: [{
          label: 'Water Consumption',
          data: data,
          borderColor: 'blue',
          borderWidth: 1,
          fill: false
        }]
      },
      options: {
        responsive: true,
        maintainAspectRatio: false,
        scales: {
          x: {
            type: 'time',
            time: {
              unit: 'minute'
            }
          },
          y: {
            title: {
              display: true,
              text: 'Water Consumption (liters)'
            }
          }
        }
      }
    });
  }

  // Fetch data every minute (adjust as needed)
  setInterval(fetchWaterData, 60000);
});
```