LEAKAGE DETECTION SYSTEM DOCUMENTATION

Project Overview:

The Leakage Detection System (LDS) in Water Pipelines is designed to address water management challenges and reduce non-revenue water. The system enables real-time monitoring and prompt detection of leaks in water pipelines. This Read Me file provides essential details and instructions for running the project.

CATEGORY 1: USING THE HOSTED PROJECT (FOR WATER DISTRIBUTION AUTHORITIES):

If you want to use the project as it is already hosted, follow these steps:

1. Ensure that your computer is connected to the internet.
2. Access the hosted Leakage Detection System at https://leakage.projects.co.tz
3. Use the provided credentials to log in to the system. Username and password TBP
4. Once logged in, you can monitor the water flow in the system. It should be noted that the system is already connected to the server and does not require any additional setup.
5. Make sure your computer is connected to the same Wi-Fi network with SSID "**guta**" and password "**guta1234**" as the rest of the modules (NodeMCU). This ensures that the system can access the sensors and display accurate information.

   Note: The mode of communication is wireless (Wi-Fi). The three nodes need to be on the same network (hot spotted with the same Wi-Fi) with SSID name "guta" and password "guta1234" (recommended). If not, the codes mounted on nodes should be changed to allow them to connect to another Wi-Fi with a different SSID and password. Ensure that these changes are reflected in the nodes for proper functionality.

   By following these steps, you will be able to access and monitor the water flow in the Leakage Detection System without the need for local setup.

CATEGORY 2: RUNNING THE PROJECT LOCALLY (FOR DEVELOPERS):

If you want to run the project on your local machine, follow these steps:

Web Part (Laravel)

Prerequisites:

- PHP
- Laravel (version 10.13.0)

Setup Instructions:

1. Make sure you have PHP and Laravel (version 10.13.0) installed on your machine.

2. Navigate to the "web" directory.

3. Run the following commands to install dependencies and set up the environment:

```
composer install
cp .env.example .env
php artisan key:generate
```

4. Configure the database settings in the `. env` file.

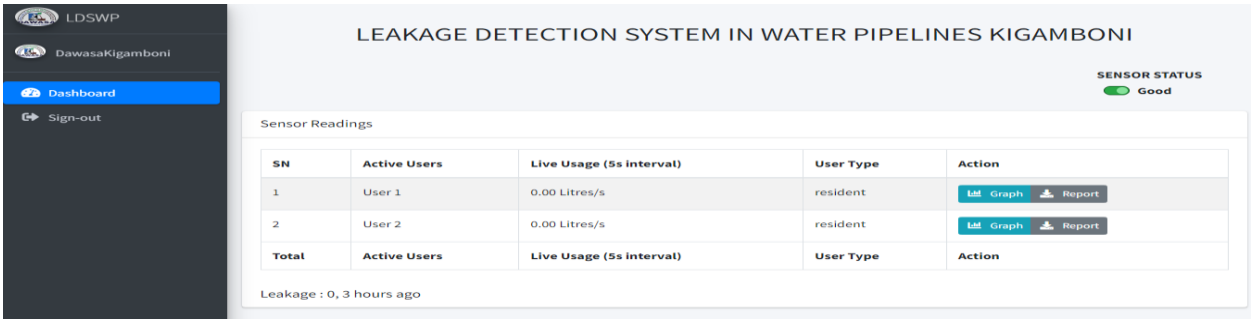
5. Run the migrations:

```
php artisan migrate
```

6. Start the Laravel development server:

```
php artisan serve
```

7. Open your browser and access the application at http://localhost:8000 or the specified URL.



NodeMCU (Arduino)

Prerequisites:

- Arduino IDE

Setup Instructions:

1. Connect the NodeMCU ESP8266 board to your computer.
2. Open the Arduino IDE and navigate to the "NodeMCU" directory.
3. Install the required libraries, if any, by going to "Sketch" > "Include Library" > "Manage Libraries".
4. Select the correct board and port from the Tools menu.
5. Upload the Arduino sketch to the NodeMCU board by clicking the "Upload" button.

SMS API (Africa's Talking)

Prerequisites:

- Active Africa's Talking account with SMS functionality

Setup Instructions:

1. Open the `africastalking` directory.

2. Configure the necessary API credentials in the appropriate configuration files.

3. Make sure the project is connected to the internet to send SMS notifications.

By following these steps, you will be able to run the Leakage Detection System locally on your machine. The web application, Arduino sketch, and SMS API integration should all be set up properly for the system to function.

For detailed instructions on system usage, configuration, and troubleshooting, refer to the documentation files, project report and source codes provided in the drive.

Contact Information

For any questions or assistance, please contact Rahma at rahmahusseintz@gmail.com