

# Aqua Guard :)

*Simulated IoT-based  
Water Management System*

# Our Team

## Team Leader :

- *Dharma Raghava Sai Shashank*

## Team Members :

- *Guna Ranjan*
- *Manasa*
- *Leela Sai*
- *Vaibhav*

# Problem Statement

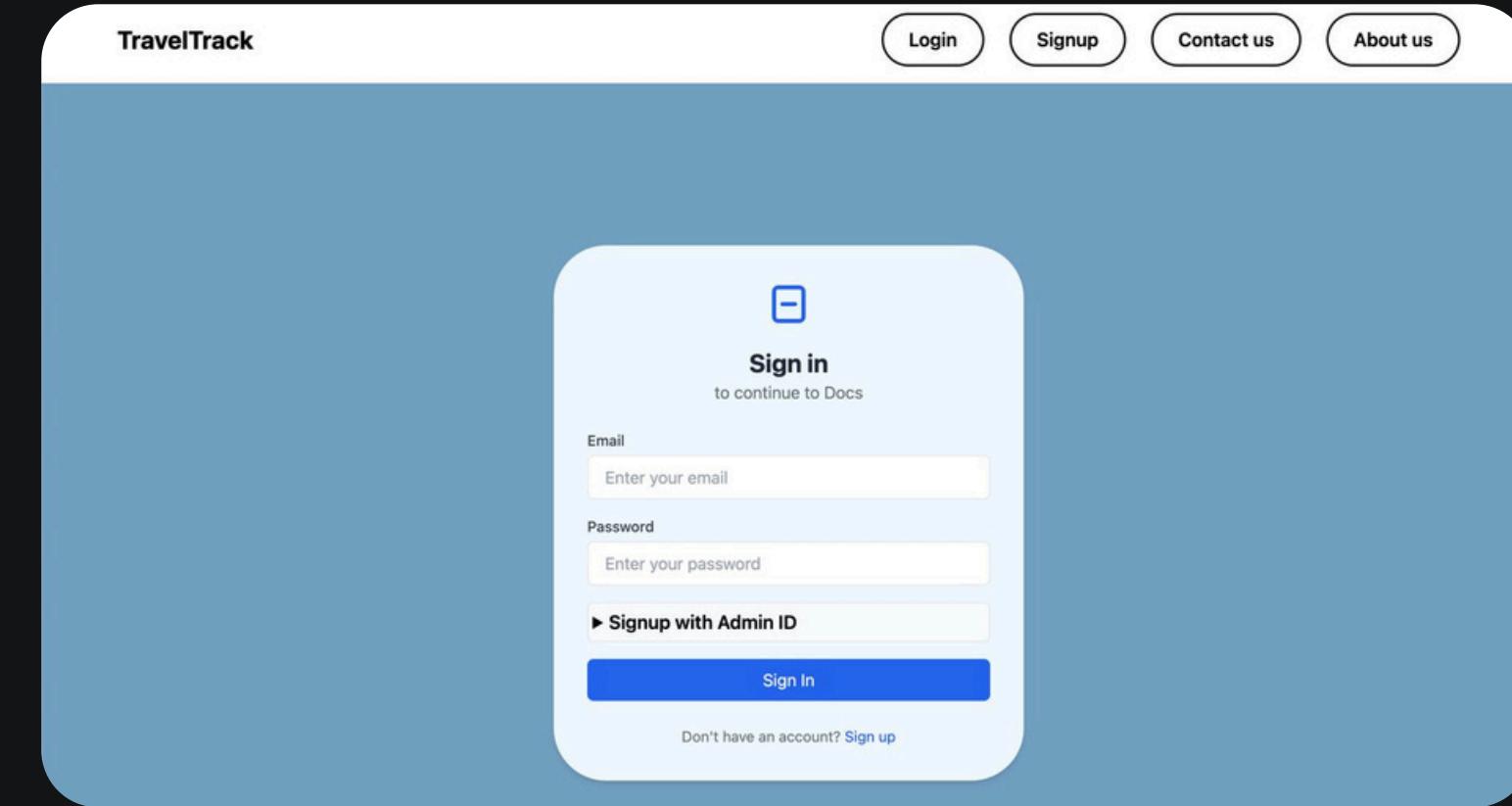
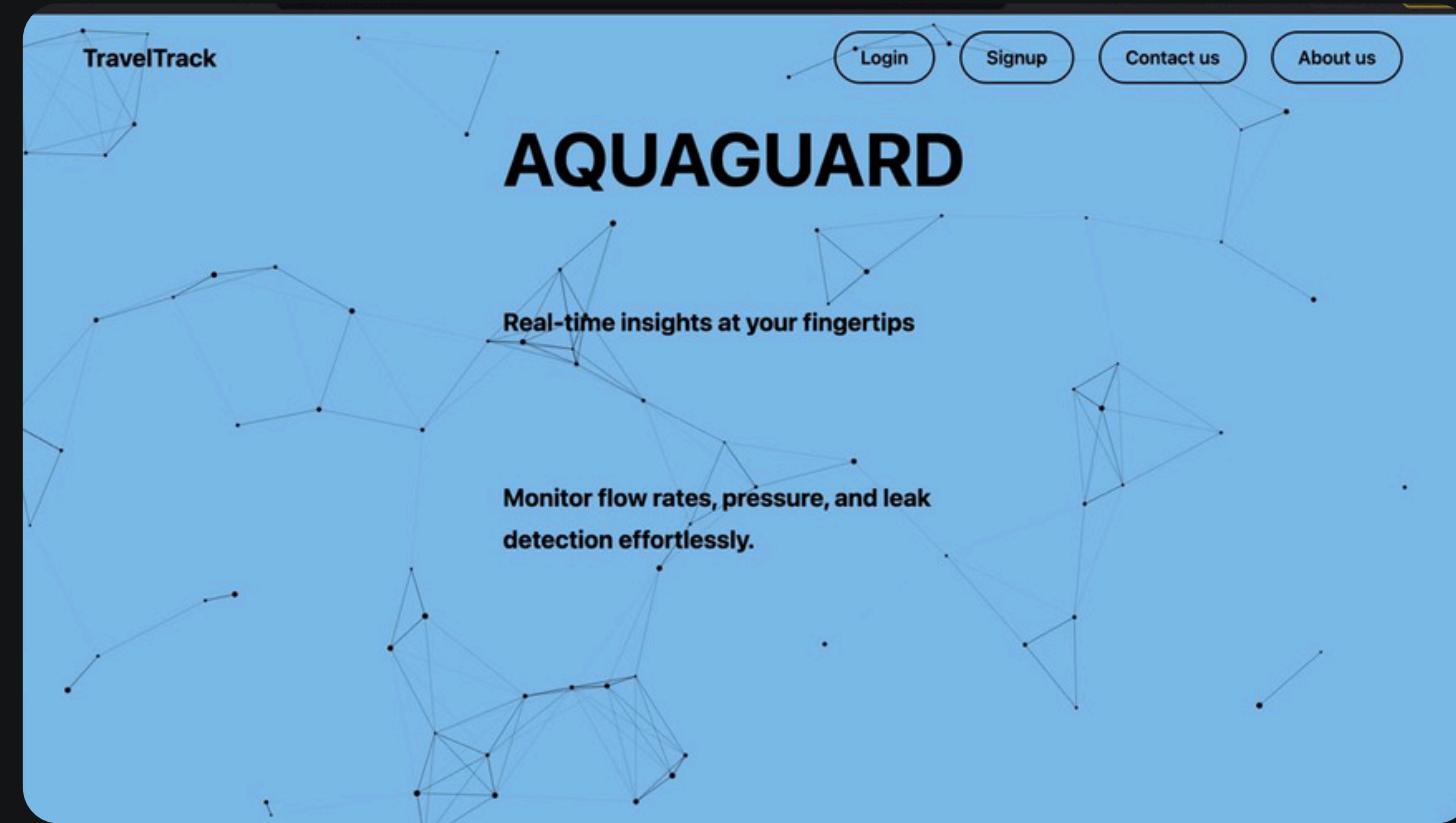
*Create a software application that simulates an IoT-based water management system, which collects data from virtual sensors, analyzes trends, and provides recommendations to improve system efficiency and reduce water loss.*

# Sensors in the System

- *Water Flow: Monitors the amount of water passing through pipes.*
- *Pressure: Tracks water pressure at key system points.*
- *Temperature: Detects anomalies like overheating or freezing.*
- *Leak Detection: Identifies possible leaks via pressure or flow drops.*



# 01



The dashboard for AQUAGUARD shows a "Warehouse List" section. The title "AQUAGUARD" is at the top left, followed by navigation buttons for "Dashboard", "Warehouses", and "logout". The "Warehouses" button is highlighted. The "Warehouse List" heading is centered above three cards, each representing a warehouse: "cqaca" (Device ID: fvhjfg, Assigned User: vaibhav74@gmail.com, Admin: 678bd3fd42713ebb44118dc1), "vaibhav" (Device ID: DEV-005, Assigned User: vaibhav74@gmail.com, Admin: 678be7ec45b017f6887881f6), and "qaaaaaaaaaa" (Device ID: Dev10, Assigned User: vai@gmail.com, Admin: 678c03ab44e55dbc8c86f5a6). Each card has a "View Details" button at the bottom right.

The dashboard for AQUAGUARD shows a user profile for "arjun". The title "AQUAGUARD" is at the top left, followed by navigation buttons for "Dashboard", "Warehouses", and "logout". The "Warehouses" button is highlighted. The user's name "arjun" and email "arjun@gmail.com" are displayed, with a note "You are an Employee". A small profile icon is shown. A message at the bottom states "As an employee, you do not have access to manage warehouses."

"Simple and interactive user interface for better decision-making."

# 02

## Water Management System

[ADD DEVICE](#)

Device ID	Water Flow (L/s)	Pressure (psi)	Temperature (°C)
6305163310			
DEV-005			
Dev-1			
Admin@gmail.com			
Device Analytics			

Add New Device

Device ID

Water Flow (L/s)  
0

Pressure (psi)  
0

Temperature (°C)  
0

CANCEL    DONE

Add new devices to initialize our system

# 03

## Water Management System

ADD DEVICE

Device ID	Water Flow (L/s)	Pressure (psi)	Temperature (°C)
6305163310	38.23	54.49	70.93
DEV-005	264.48	152.82	7.2
Dev-1	449.11	106.66	65.04
Admin@gmail.com	408.57	94.89	73.14

Device Analytics: Admin@gmail.com

Water Flow (L/s) Pressure (psi) Temperature (°C)

350

"Acquiring virtual data at regular interval of time."

# 04

Device ID

6305163310

DEV-005

Dev-1

Admin@gmail.co

Device Analytics

350

300

250

## Adjust Sensor Data

Water Flow (L/s)



Current: 39.79

Pressure (psi)



Current: 53.80

Temperature (°C)

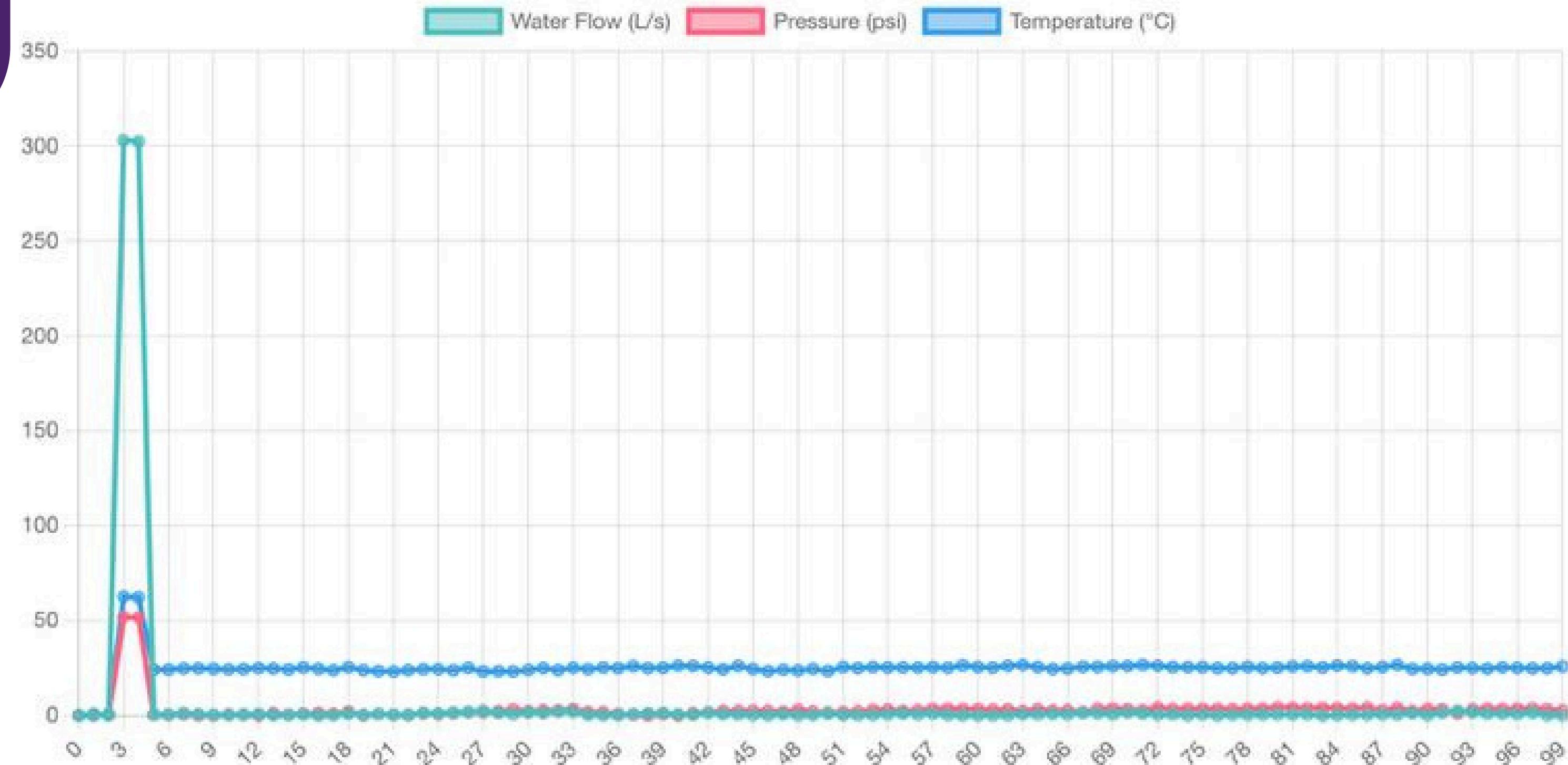
CLOSE

Current: 70.95

Admin can adjust the data manually in case of sensor failure

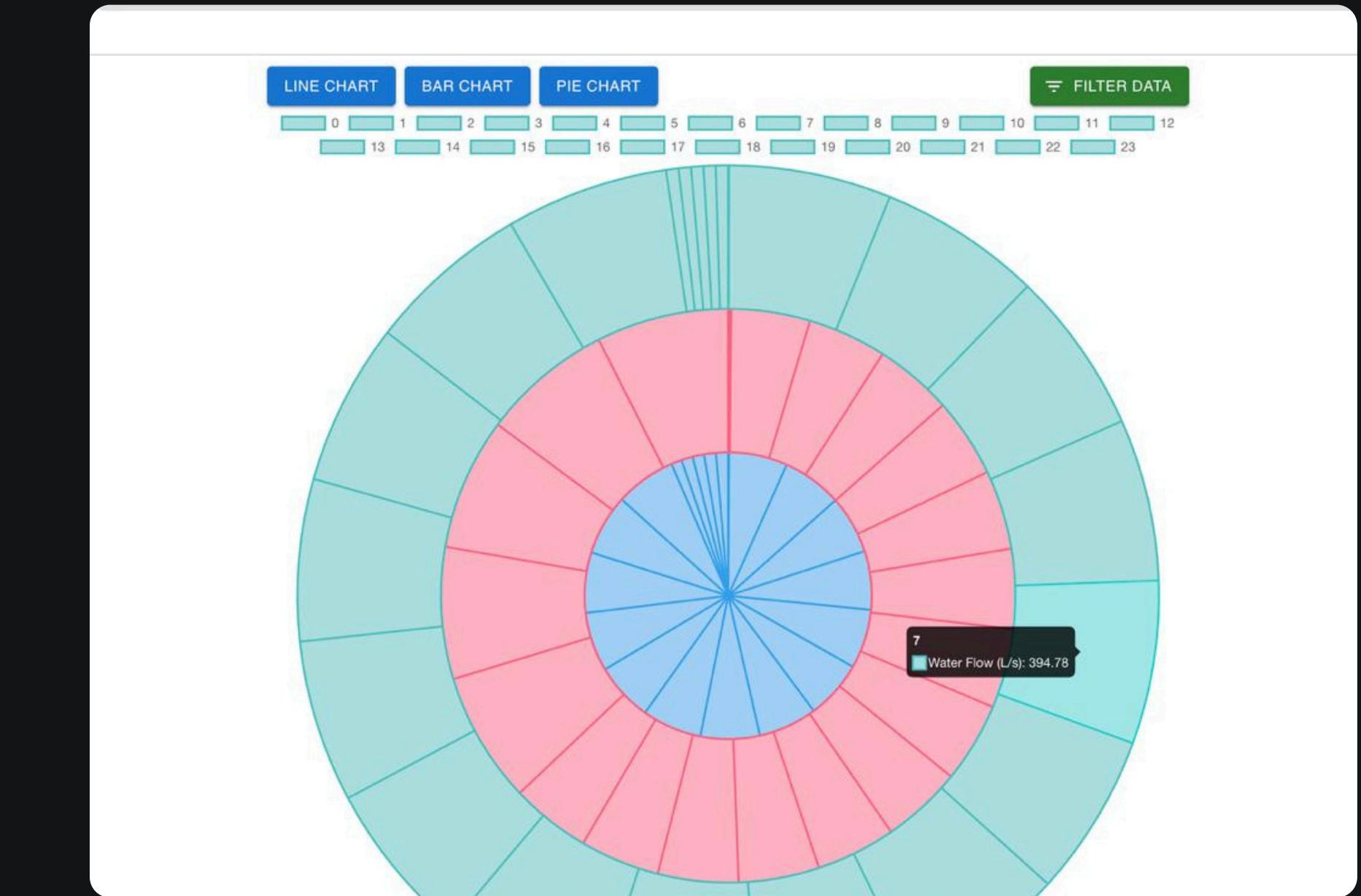
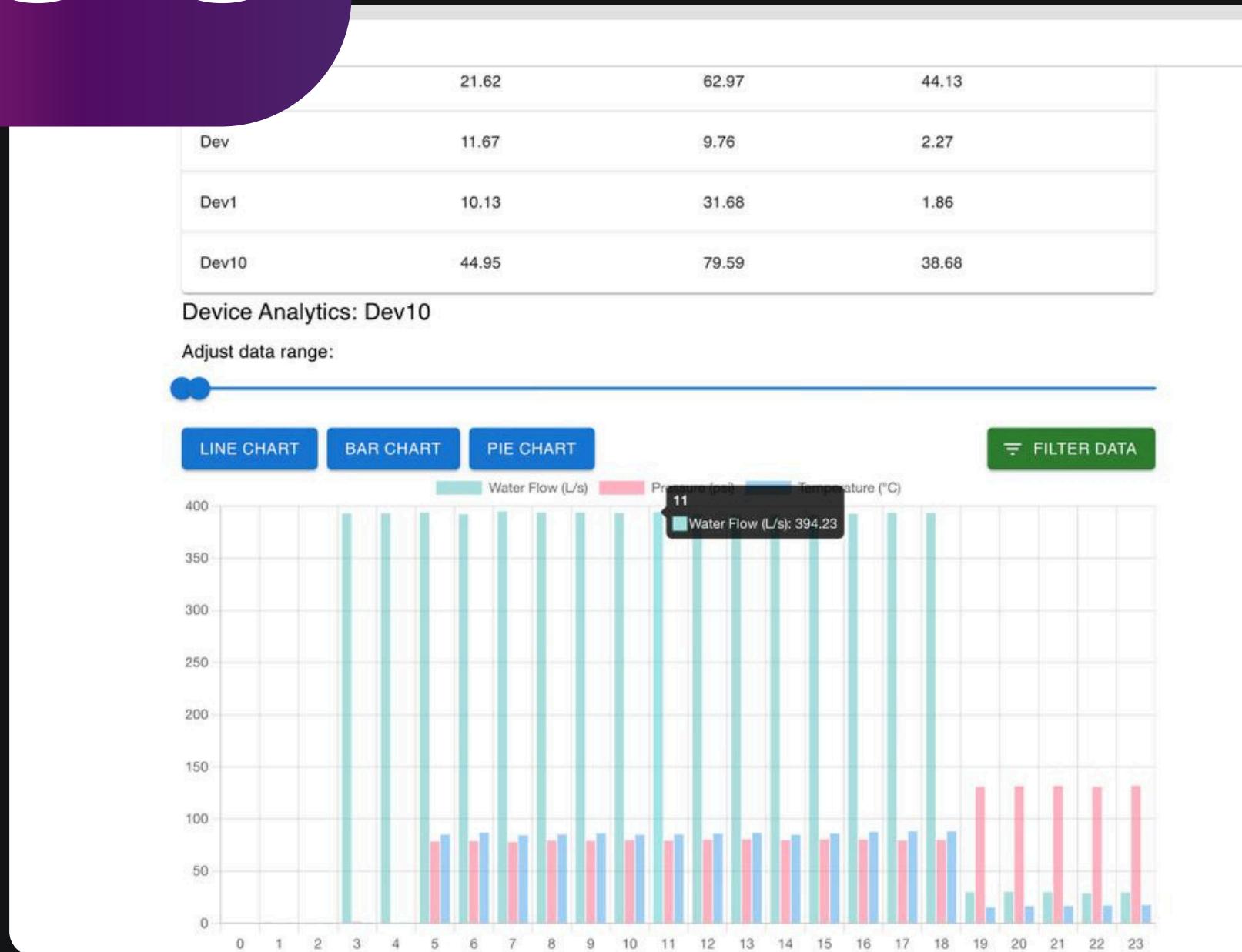
# 05

Device Analytics: 6305163310



"Detecting leaks through pressure drops and flow anomalies."

# 06



"Visualizing data for actionable insights and intuitive understanding."

# 07

The screenshot shows a web browser window with the URL [localhost:5173/show\\_watermanagement/DEV-005](localhost:5173/show_watermanagement/DEV-005). The page title is "predictive maintenance program based on historical data and system analysis." The main content area contains two sections: "Temperature AI Recommendations" and "Pressure AI Recommendations".

**Temperature AI Recommendations**

The temperature readings show a general upward trend with some significant fluctuations, suggesting potential instability in the thermal process and possible system inefficiencies. The large jumps, particularly the increase to 110.35, indicate potential issues with the heating system's control or a malfunction in a heating element or sensor, impacting product quality and energy efficiency. Improved insulation and regular maintenance of heating and cooling equipment are crucial, focusing on identifying and addressing the cause of these sharp temperature spikes. Implementing a more frequent and precise temperature monitoring system, combined with data analysis to detect anomalies early, can help prevent further issues and optimize energy consumption. Regular calibration of sensors and proactive maintenance based on data-driven insights will minimize downtime and improve overall thermal process efficiency.

**Pressure AI Recommendations**

The pressure readings show significant variation, ranging from 2.21 to 4.11, indicating potential system instability and possible safety concerns. Low readings like 2.21 and 2.34 suggest potential leaks or compressor malfunction, while high readings such as 4.11 may indicate excessive pressure build-up. This variability impacts system efficiency; consistently low pressure reduces output, while high pressure increases the risk of equipment failure. We need to investigate the lowest and highest readings to identify the source of the fluctuations. Immediate actions include inspecting seals, compressors, and pressure relief valves; improving monitoring frequency and implementing a predictive maintenance program to minimize downtime and maximize safety.

"Dynamic recommendations to optimize water usage and prevent loss."

*"Together, let's ensure efficient water  
management for all!"*

Thank You :)