Marwadi University
Faculty of Technology
Department of Information and Communication Technology

Project Title: "Cloud-based IoT System for Remote Control and Monitoring of Electronic Devices"

Team Members:

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Abstract:

In this project, we propose to build a cloud-based IoT system that enables remote control and monitoring of electronic devices, such as lights, fans, water pumps, and other appliances. The system will use sensors and microcontrollers to collect data about the devices and transmit them to a cloud-based database, providing users with valuable data about their devices' usage and energy consumption. Users will be able to control the devices and monitor their status using a web-based interface, which will be designed to be user-friendly and accessible from anywhere. Automation features, such as timers and other triggers, will be available to enable users to automate their devices and save time and effort. The proposed solution will have several benefits, including increased reliability, reduced risk of human error and saving time and effort by enabling remote control of devices.

Description:

The problem of managing electronic devices remotely has become increasingly important in recent years. With the growing trend of smart homes and IoT, people are looking for ways to control their devices remotely. However, existing solutions often require complex hardware and software setups, which can be difficult and expensive to implement. Moreover, these solutions may not be reliable, and users may face difficulties in monitoring their devices remotely.

To address this problem, we propose to build a cloud-based IoT system that will enable users to control and monitor their devices remotely. The system will use sensors and microcontrollers to collect data about the devices and transmit them to a cloud-based database. Users will be able to control the devices and monitor their status using a web-based interface. The system will help users save time and effort by enabling remote control of devices and reduce the risk of human error.

The system will use a variety of sensors to collect data about the devices, such as current sensors to monitor the status of the device. By using current sensors, we can avoid false signals and ensure

that the device is actually turned on when the user sees the status on the website. Moreover, the system will use cloud-based storage to store data securely and ensure that users can access the data anytime and anywhere.

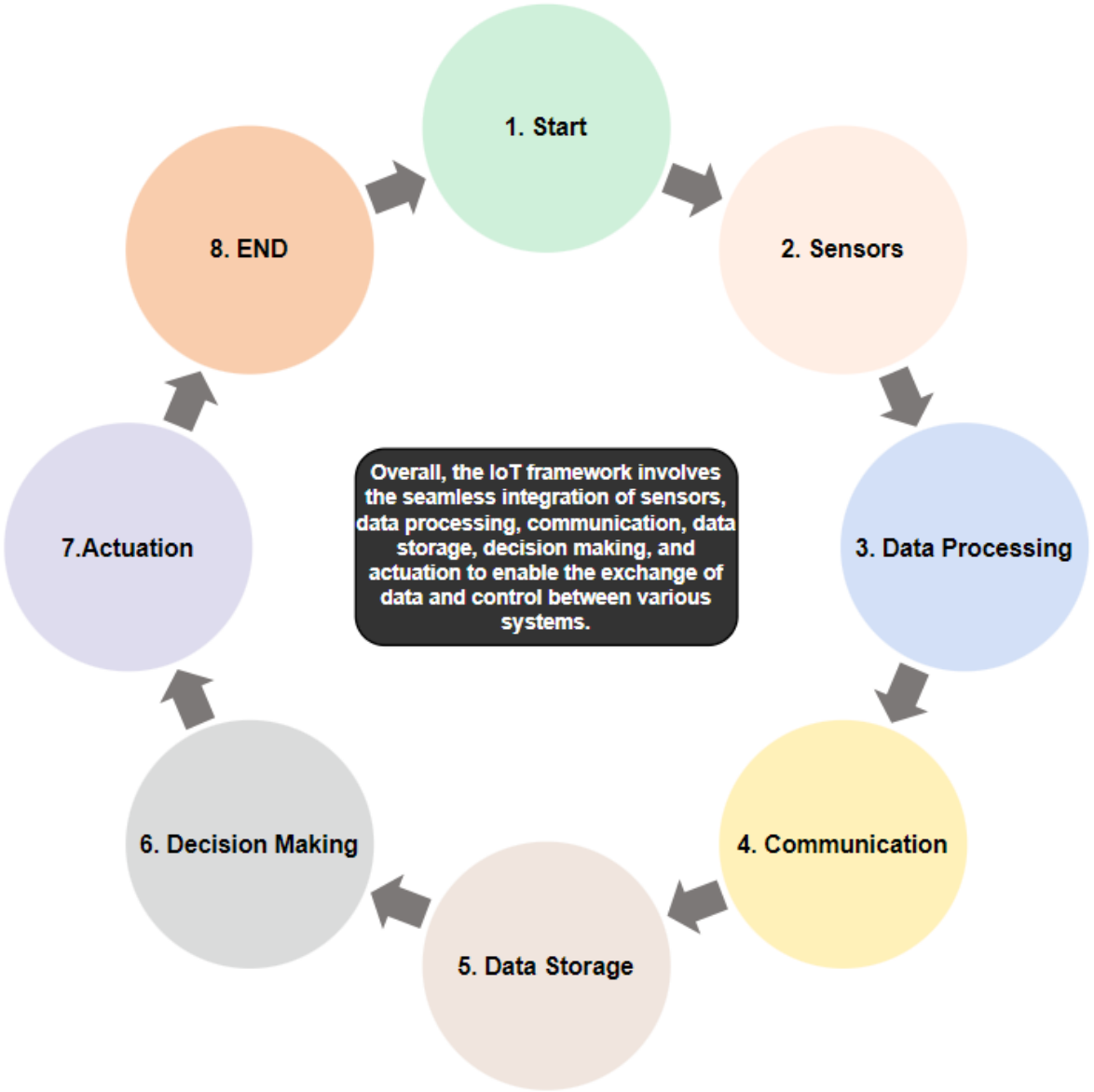
Proposed Idea/Solution:

- The proposed solution consists of a cloud-based IoT system that will enable users to control and monitor their devices remotely. The system will consist of the following components:
- IoT devices: We will use microcontrollers such as Arduino or ESP32 to control the devices and collect data from the sensors.
- Sensors: We will use a variety of sensors to collect data about the devices, such as current sensors to monitor the status of the device.
- Cloud-based database: We will use a cloud-based database such as Firebase or AWS to store data securely and ensure that users can access the data anytime and anywhere.
- Web-based interface: We will create a web-based interface that will enable users to control the devices and monitor their status.
- Automation: We will enable users to automate their devices using timers and other triggers. For example, in a farm, users can set a timer to turn on the water pump at specific times.
- The proposed solution will have several benefits. Firstly, it will enable users to control their devices remotely, saving time and effort. Secondly, it will reduce the risk of human error and increase the reliability of the system. Finally, it will provide users with valuable data about their devices, such as usage statistics and energy consumption, which can help them make informed decisions about their usage. According to a recent study, remote control of electronic devices can save up to 20% of the total energy consumption of a household.

Target Community:

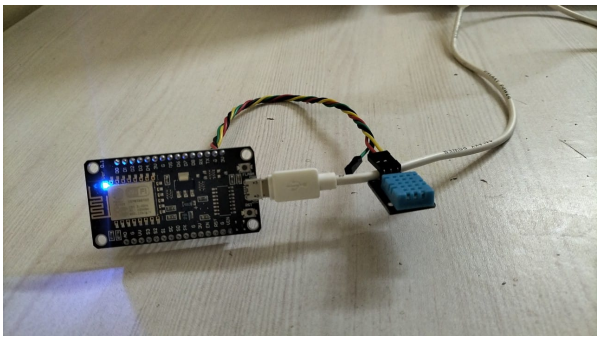
The target community for this solution includes households, farms, and other environments where remote control and monitoring of electronic devices are required. The solution can be used to control a wide range of devices, such as lights, fans, water pumps, and other appliances.

Process Flow/Block Diagram:

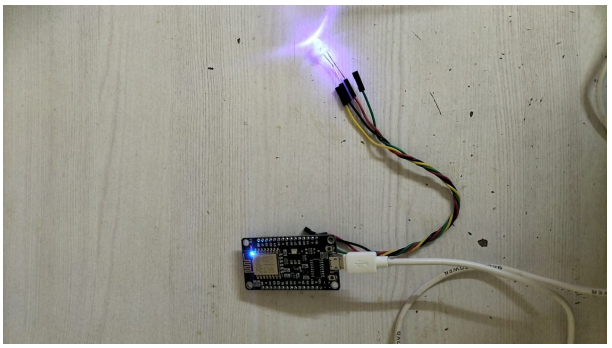


Initial Results (with Images):

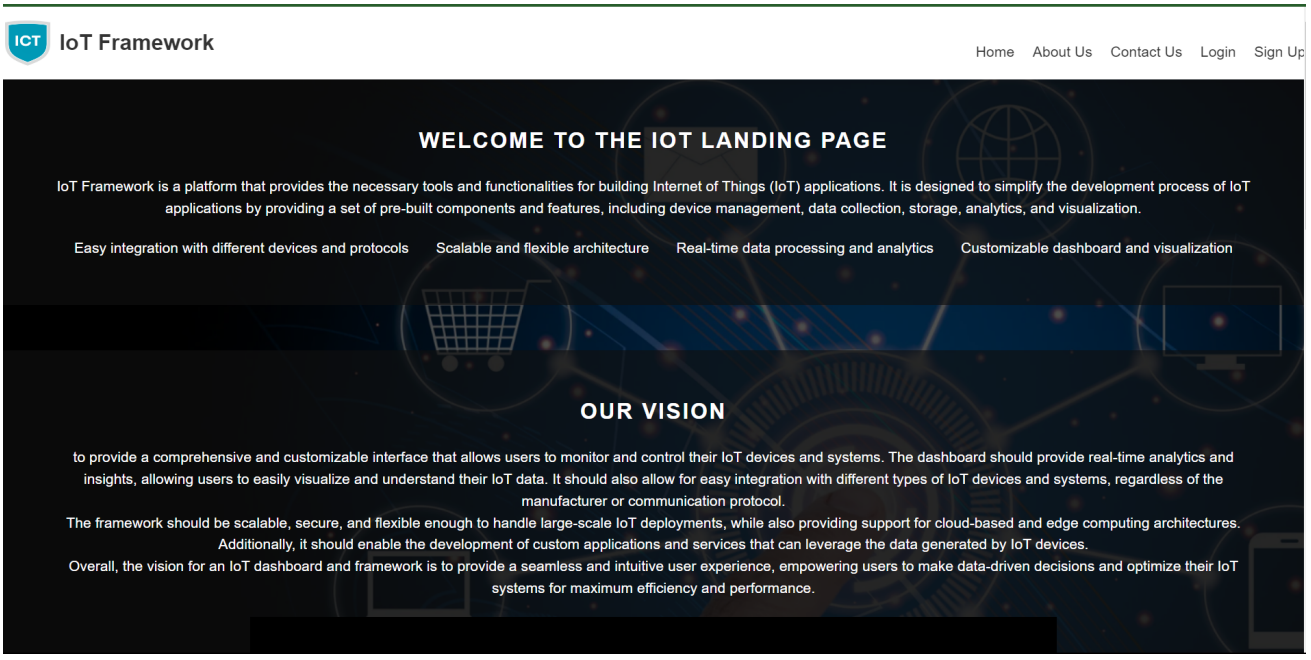
DHT sensor: showing live humidity and temperature values on the website

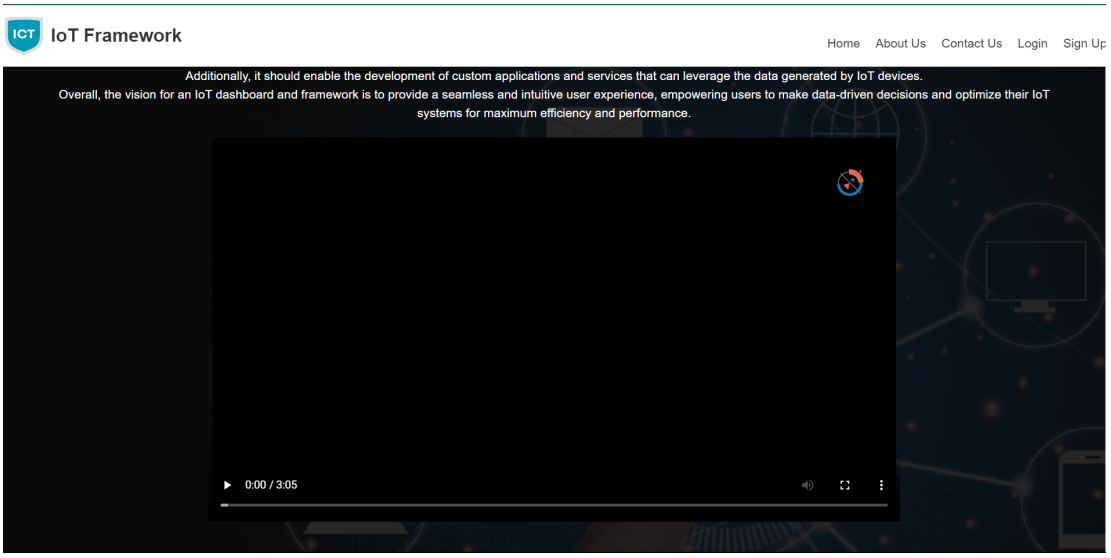


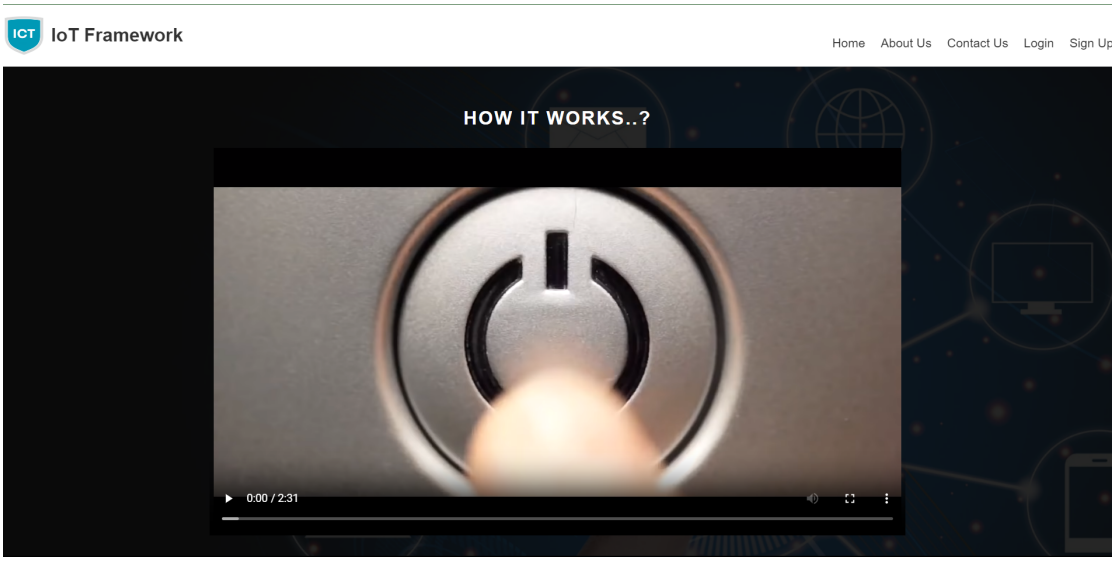
LED: remotely controlling a led through a website while showing how long it's been on.

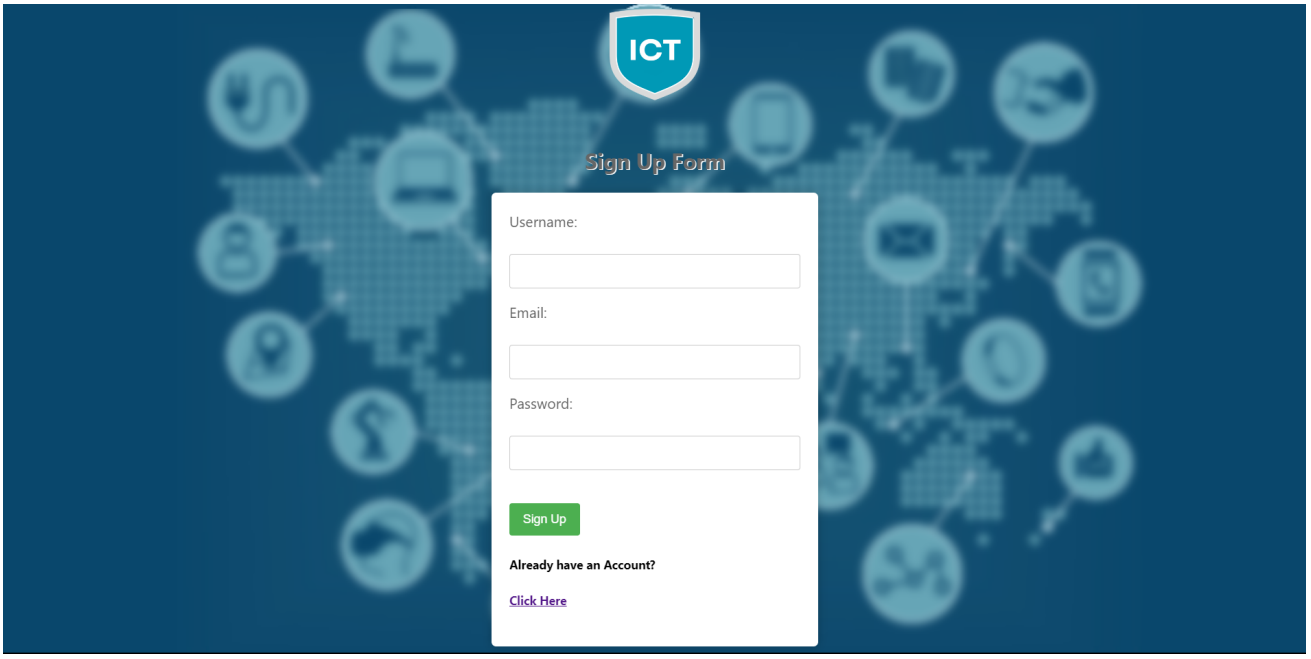


Website:

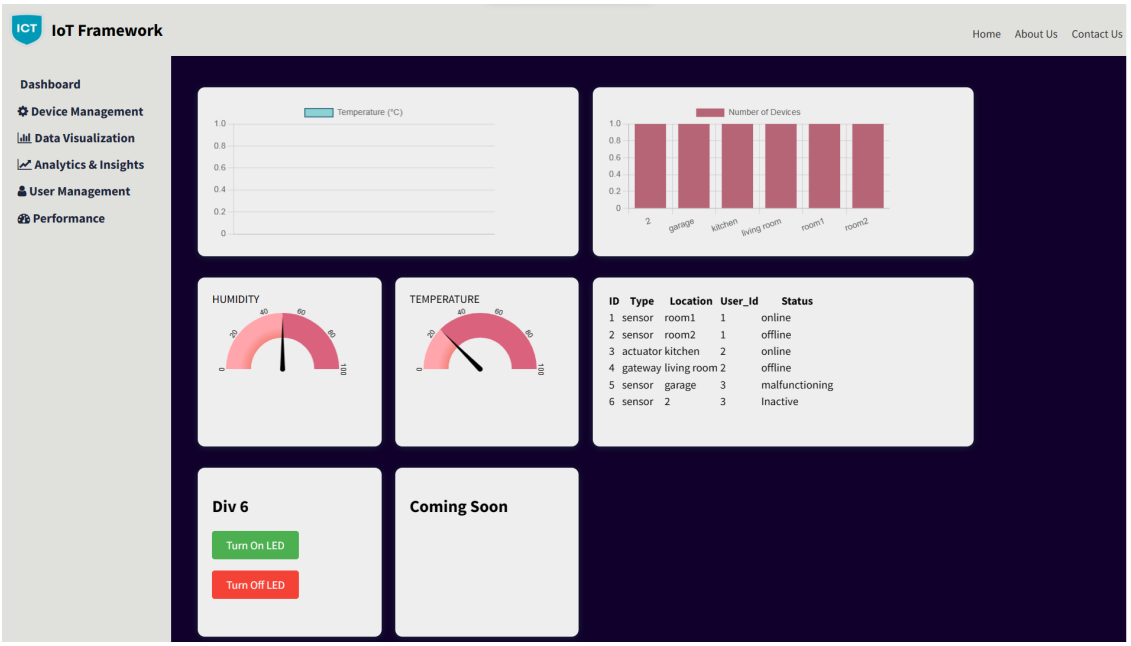


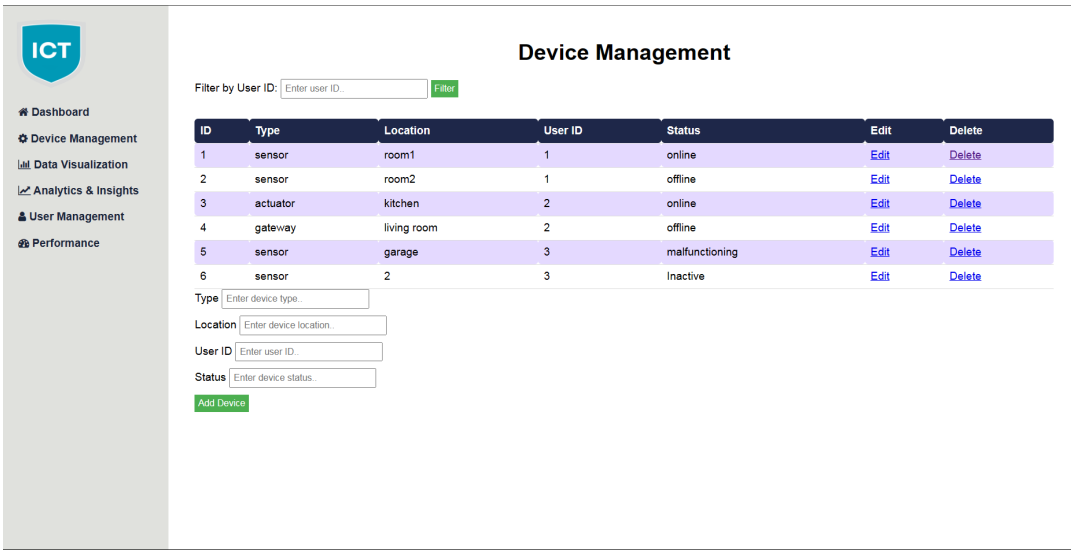


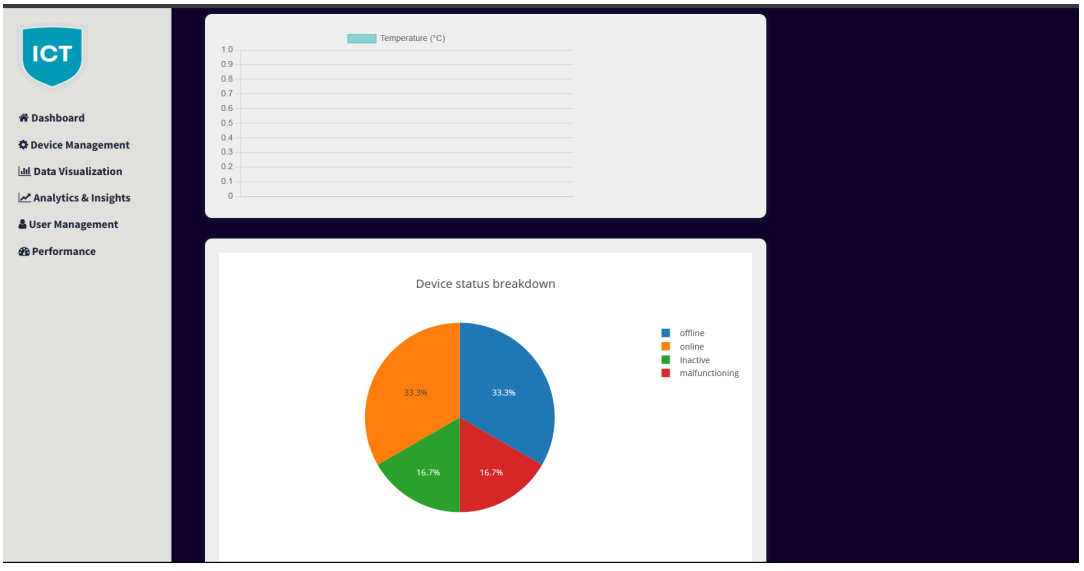


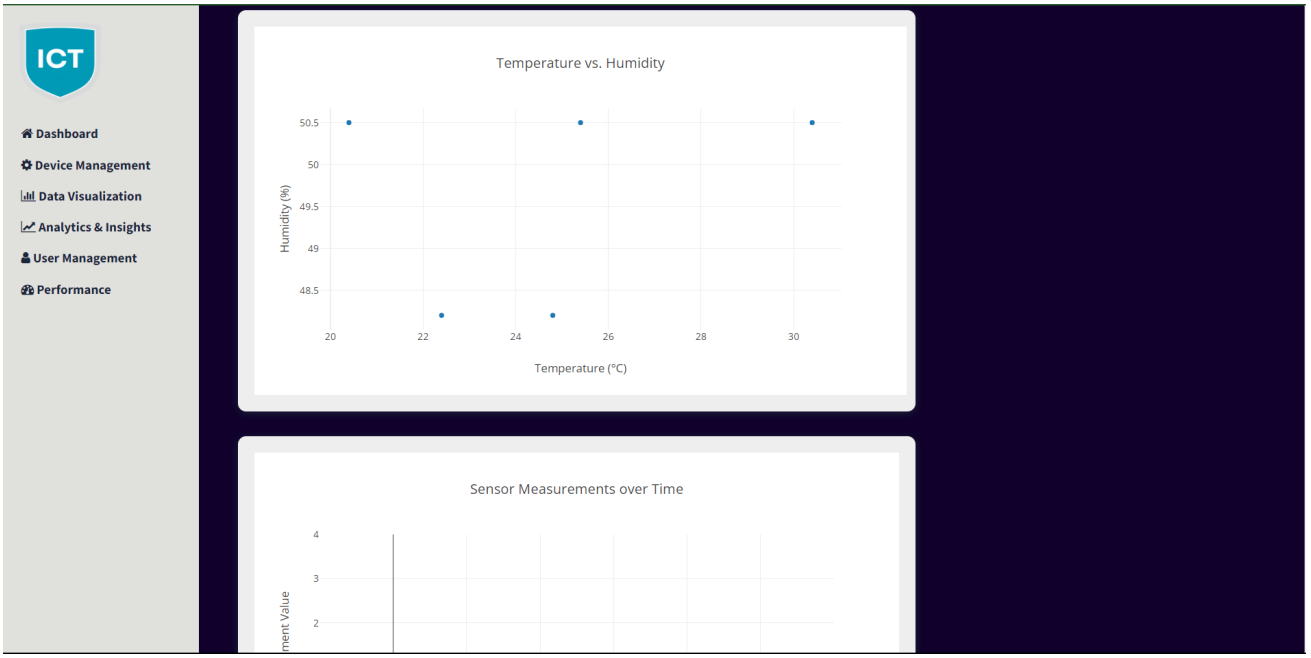

ICT
Sign Up Form
Username:
Email:
Password:
Sign Up
Already have an Account?
Click Here

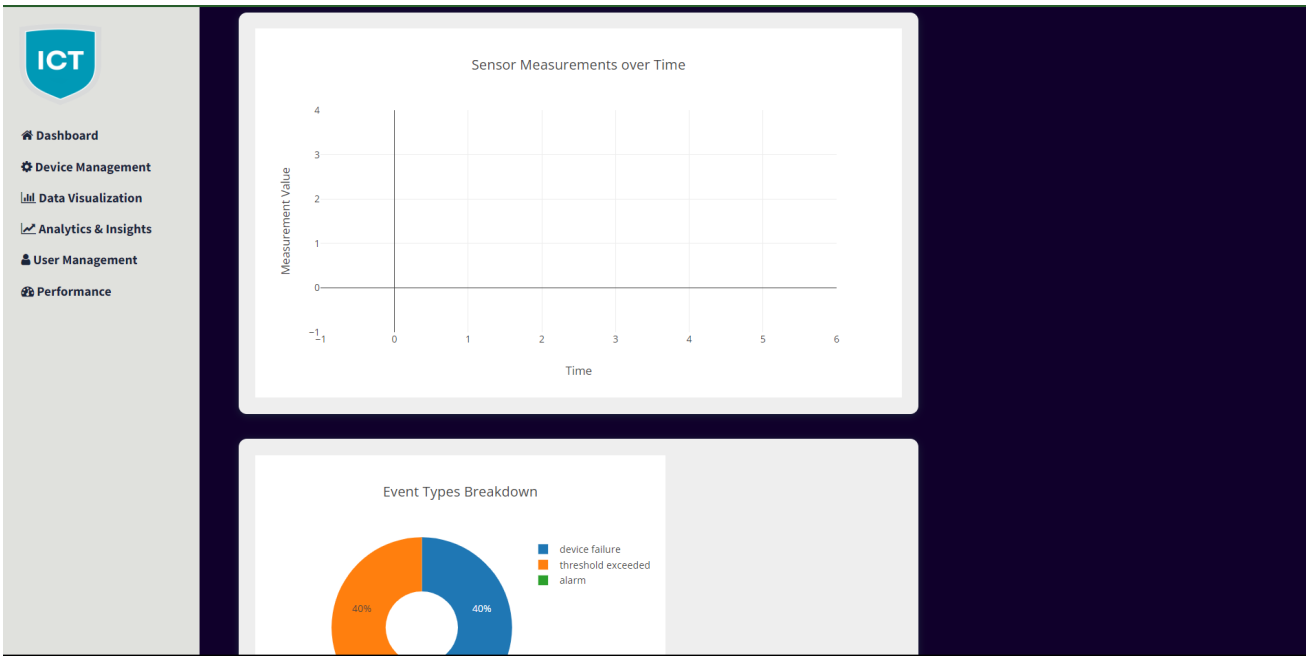

ICT
Login Form
Username:
Password:
Login


IoT Framework
Home
About Us
Contact Us
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Temperature (°C)
Number of Devices
2
garage
kitchen
living room
room1
room2
HUMIDITY
TEMPERATURE
ID Type Location User_Id Status
1 sensor room1 1 online
2 sensor room2 1 offline
3 actuator kitchen 2 online
4 gateway living room 2 offline
5 sensor garage 3 malfunctioning
6 sensor 2 3 Inactive
Div 6
Turn On LED
Turn Off LED
Coming Soon


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Device Management
Filter by User ID:
Enter user ID..
Filter
ID Type Location User ID Status Edit Delete
1 sensor room1 1 online Edit Delete
2 sensor room2 1 offline Edit Delete
3 actuator kitchen 2 online Edit Delete
4 gateway living room 2 offline Edit Delete
5 sensor garage 3 malfunctioning Edit Delete
6 sensor 2 3 Inactive Edit Delete
Type
Enter device type..
Location
Enter device location..
User ID
Enter user ID..
Status
Enter device status..
Add Device

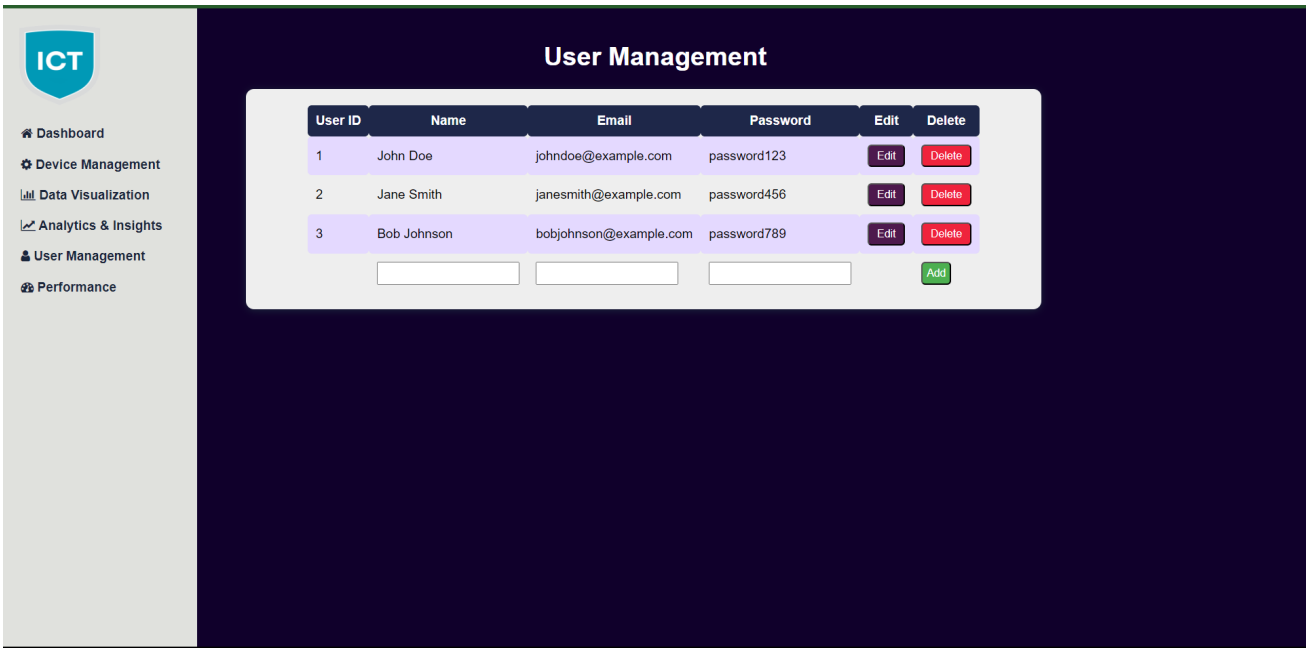

ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Temperature (°C)
Device status breakdown
33.3%
33.3%
16.7%
16.7%
offline
online
Inactive
malfunctioning


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Temperature vs. Humidity
Humidity (%)
50.5
50
49.5
49
48.5
20
22
24
26
28
30
Temperature (°C)
Sensor Measurements over Time
4
3
2


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Sensor Measurements over Time
Measurement Value
4
3
2
1
0
−1
−1
0
1
2
3
4
5
6
Time
Event Types Breakdown
device failure
threshold exceeded
alarm
40%
40%


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
Event Types Breakdown
device failure
threshold exceeded
alarm
40%
40%
20%
Temperature Distribution per Location
room1
room2
Temperature
30
28
26
24


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
20%
Temperature Distribution per Location
room1
room2
30
28
26
24
22
20
Temperature
room1
room2
Location


ICT
Dashboard
Device Management
Data Visualization
Analytics & Insights
User Management
Performance
User Management
User ID
Name
Email
Password
Edit
Delete
1
John Doe
johndoe@example.com
password123
Edit
Delete
2
Jane Smith
janesmith@example.com
password456
Edit
Delete
3
Bob Johnson
bobjohnson@example.com
password789
Edit
Delete
Add