SMART INDIA HACKATHON 2024

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- **Problem Statement ID:** SIH1525
- **Problem Statement Title:** Innovating for Sustainability:
- Driving Smart Resource Conservation (Energy & Water) in Home Appliances (Refrigerators, Air Conditioners, Washing Machines and Desert Air Coolers).
- **Theme:** Smart Resource Conservation
- **PS Category:** Software
- **Team ID:** 19533
- **Team Name:** Sustainers

PROPOSED SOLUTION

Solution:
A comprehensive software platform designed to monitor, analyse, and optimize energy and water consumption in home appliances, helping users achieve efficient resource management and sustainability.

Target:
Enhancing appliance efficiency and reducing water and energy waste are key to sustainable household management and promoting sustainable living.

Innovation & Uniqueness:
ML-driven real-time analytics, personalized optimization suggestions with user-friendly interface, reducing ecological footprint. Built with Python for simplicity, and accessibility.

Explanation:

1. Real-Time Monitoring:
Tracks appliance usage and provides real-time data on temperature and humidity, store it in cloud enabling users to monitor their resource usage effectively.

2. ML-Driven Optimization:
Leverages ML to predict energy and water consumption and analyse user behaviour offering personalized optimization suggestions, helping reduce energy and water waste.

3. User Interface:
Features a user-friendly interface that simplifies navigation and makes it easy to understand appliance data and implement optimization insights.

METHODOLOGY AND IMPLEMENTATION

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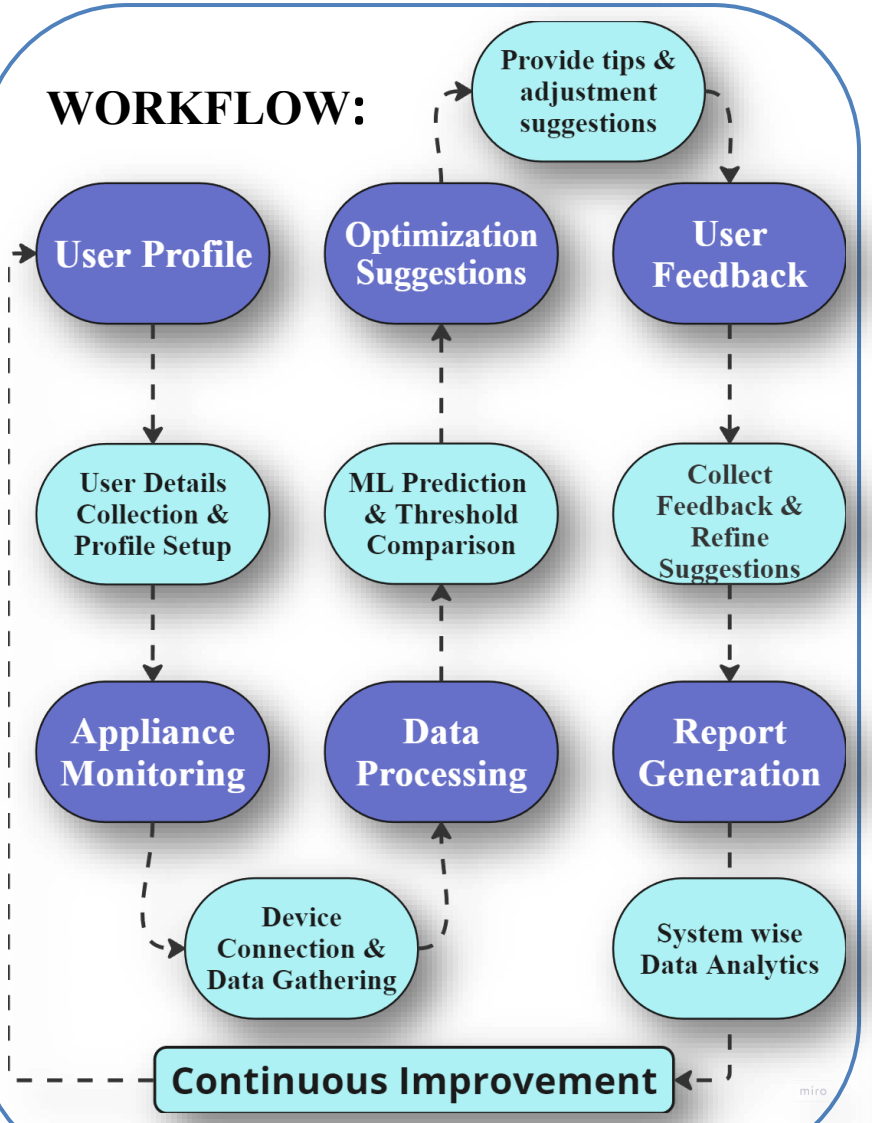
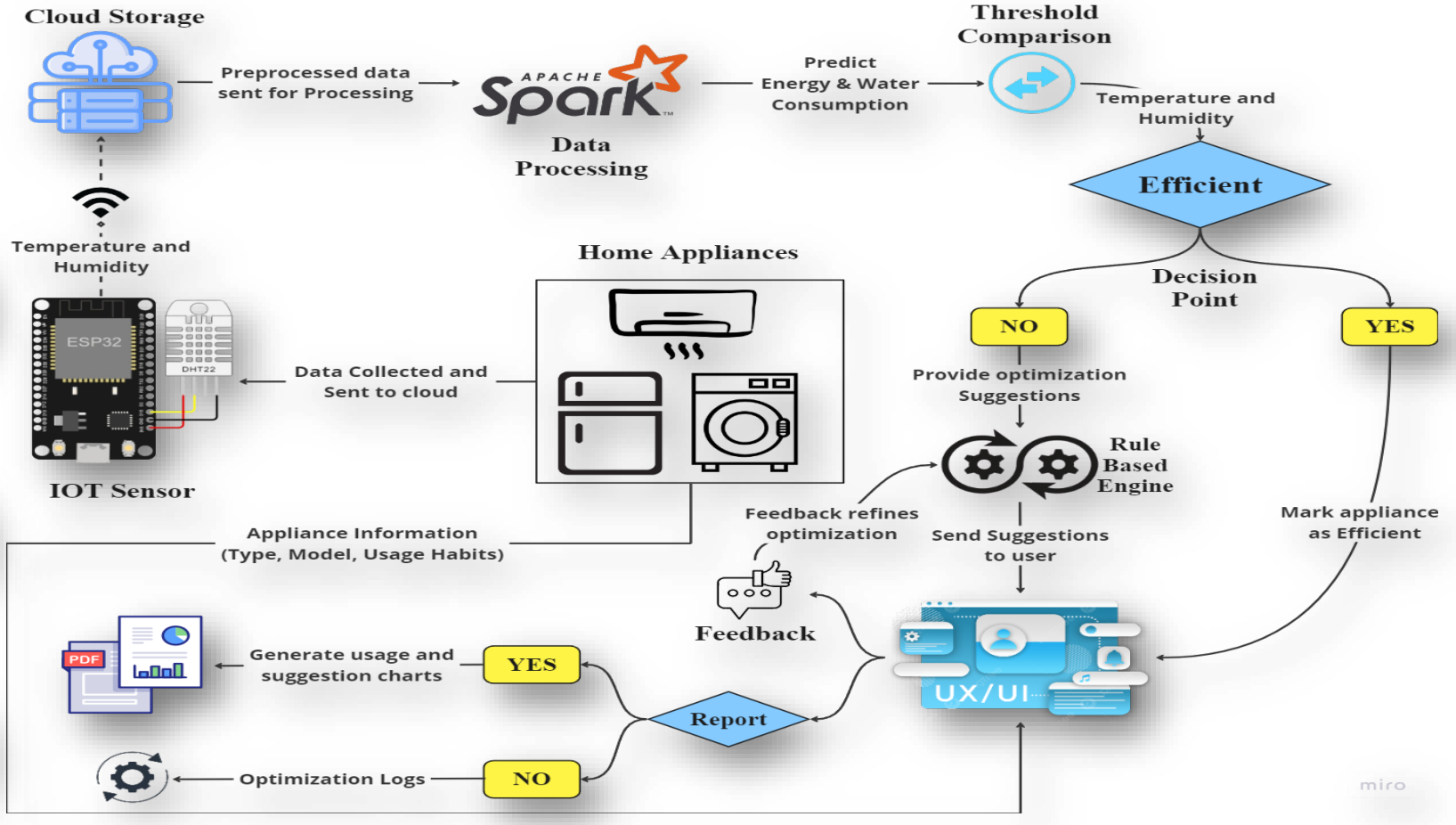
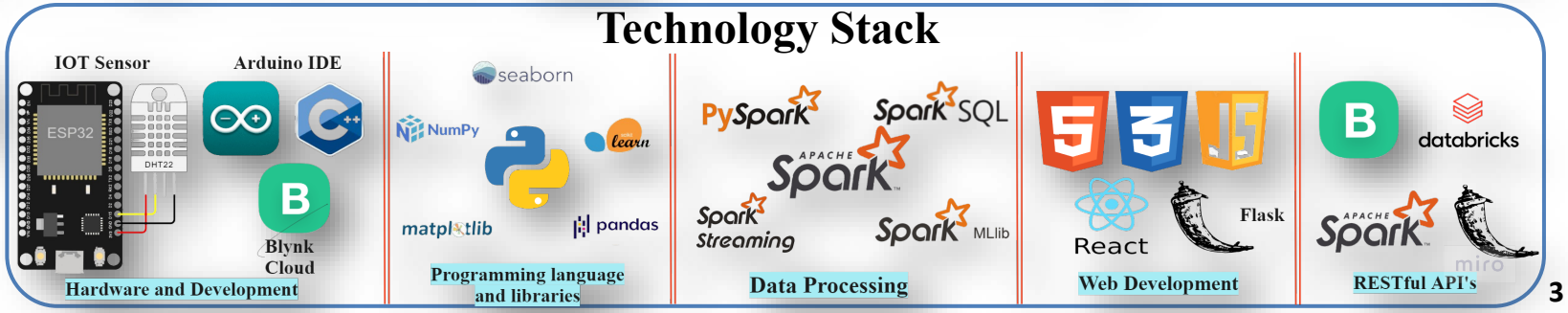
WORKFLOW:





Technology Stack



FEASIBILITY AND VIABILITY

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Technical Feasibility

Uses Python for backend development, with a web based GUI for user interaction. Suitable for small to medium-sized households, leveraging IoT sensors, cloud services, and machine learning to optimize energy and water usage.

Data Privacy

We prioritize data security, implementing strong encryption and protection measures to ensure user privacy.

- **Challenge:** Securing user data.
- **Strategy:** Strong encryption and protection measures

User Engagement

By implementing clear data visualization, personalized recommendations, and user-friendly interfaces, we strive to promote consistent user engagement.

1

2

3

4

5

Scalability

Designed to manage growing user bases and appliance data volumes, supporting future expansion to accommodate more users and devices.

- **Challenge:** Handling more appliances and users
- **Strategy:** Modular system design

Data Accuracy

Ensures precise appliance data collection through robust testing and validation.

- **Challenge:** Data collection accuracy
- **Strategy:** Robust testing and validation

IMPACT AND BENEFITS

IMPACT

1. **Empowers Users:**
Enables homeowners to make informed decisions, reducing their energy and water bills.

2. **Encourage Sustainability:**
Promotes sustainable living practices, contributing to broader environmental goals.

3. **Increased Convenience:**
Simplifies appliance management by automating optimization processes, improving overall quality of life.

BENEFITS

1. **Social:**
Promotes sustainable living and raises awareness, encouraging community action on sustainability.

2. **Economic:**
Reduces utility costs through optimized appliance usage, helping households save money.

3. **Environmental:**
Lowers carbon footprint and conserves water resources, supporting global sustainability goals.

RESEARCH AND REFERENCES

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Sustainability is not a Trend, It's a Responsibility

Research and Reference Links
Godrej Information about Godrej Home Appliances.
Dataset Containing Details about Home Appliances and Suggestions.
Report & POC A Detailed Document for Proposed Solution and Implementation
Prototype The intuitive Web interface designed for User Interaction.

Google Drive:
For Project Reference

GitHub:
For Code Reference