

## **TEAM NAME: 17\_Ecolife**

**DOMAIN:** Sustainability and Green Economy

**PROBLEM STATEMENT:** Resource Usage and Impact  
Analytics Platform

S.No	Team Members	Roll No
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## **Functional Requirements**

Functional requirements describe what the system is supposed to do, including the services it provides and the actions it performs in response to user input.

### **User Management**

- Users can register, login, and logout
- Users can update personal and organizational profiles
- Role-based access control: Resource User, Sustainability Manager, Operations Manager
- Admin can manage user roles and permissions

### **B. Resource Usage Management**

- Resource Users can submit resource usage data (energy, water, fuel, etc.)
- System validates submitted usage data
- Usage data is stored with timestamps and user reference
- System checks usage against predefined thresholds
- Generate alerts when usage exceeds thresholds

### **C. Environmental Impact Analysis**

- Sustainability Manager can request environmental impact analysis
- System retrieves usage data
- System retrieves emission factors from Emission Factors Database
- System calculates environmental impact (e.g., carbon footprint)
- Display environmental impact summary to manager
- Notify managers when required data is missing

### **D. Sustainability Targets & Progress Tracking**

- Sustainability Manager can define sustainability targets (emission reduction, usage limits)
- System validates target inputs
- Store sustainability targets securely
- Track progress against defined targets
- Compare actual impact with targets
- Display progress status and trend indicators

## **E. Usage Overview & Consumption Trends**

- Users can request usage overview
- System identifies user role (personal or managerial view)
- Retrieve and filter usage data
- Provide personal usage summary for Resource Users
- Aggregate data for overall trends for Managers
- Analyse usage patterns and generate trend insights

## **F. Alerts & Notifications**

- Send usage alerts when thresholds are exceeded
- Notify users about successful submissions
- Notify managers about missing or inconsistent data
- Display system notifications in real time

## **G. Reporting & Monitoring**

- Generate reports on resource usage and environmental impact
- View dashboards for usage, emissions, and targets
- Maintain audit logs for submissions and changes
- Export reports for compliance and review

## **Non-Functional Requirements**

Non-functional requirements specify quality attributes and constraints of the system such as performance, security, and reliability.

### **A. Product Requirements**

#### **1. Efficiency Requirements**

- System should handle multiple concurrent users
- Data retrieval and analysis should be optimized

#### **2. Performance Requirements**

- Page response time  $\leq$  2 seconds
- Impact calculations should complete within acceptable time limits

### **3. Space Requirements**

- Efficient database storage for usage and emission data
- Archive historical data without performance degradation

### **4. Usability Requirements**

- Simple and intuitive UI
- Dashboard-based visualization
- Mobile and tablet friendly interface

### **5. Dependability Requirements**

- System availability 24/7
- Data backup and recovery mechanisms
- High reliability for critical calculations

### **6. Security Requirements**

- Secure authentication and authorization
- Role-based access control
- Encryption of sensitive data

## **B. Organizational Requirements**

### **1. Operational Requirements**

- Web-based system
- Cloud deployment support

### **2. Environmental Requirements**

- Operates under low bandwidth conditions
- Optimized for continuous monitoring systems

### **3. Development Requirements**

- Modular architecture
- Easy to maintain and extend
- Use standard UML and software engineering practices

## **C. External Requirements**

### **1. Regulatory Requirements**

- Compliance with environmental reporting standards
- Support regulatory audits

## **2. Ethical Requirements**

- Accurate representation of usage and impact data
- No manipulation of sustainability metrics

## **3. Legislative Requirements**

- Compliance with data protection and IT laws
- Maintain legal audit trails

## **4. Accounting Requirements**

- Track sustainability investments and efficiency gains
- Generate reports for management review

## **5. Safety / Security Requirements**

- Protection against unauthorized access
- Secure communication with external databases

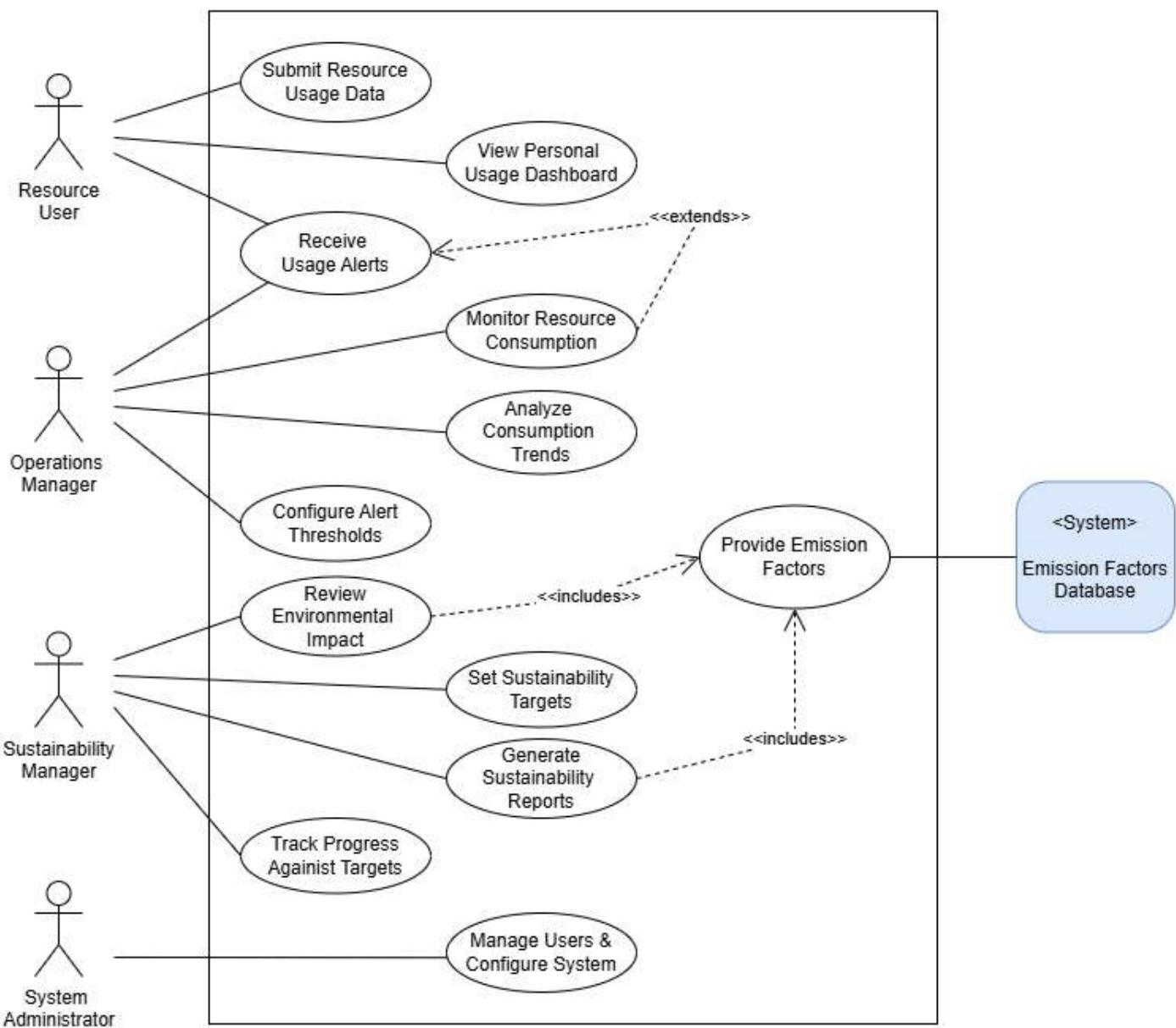
## **UML Diagrams**

The system includes the following UML diagrams:

- Use Case Diagrams
- Activity Diagrams
- Sequence Diagrams (4 core diagrams):
  1. Submit Resource Usage Data
  2. Review Environmental Impact
  3. Track Sustainability Targets & Progress
  4. View Resource Usage & Consumption Trends

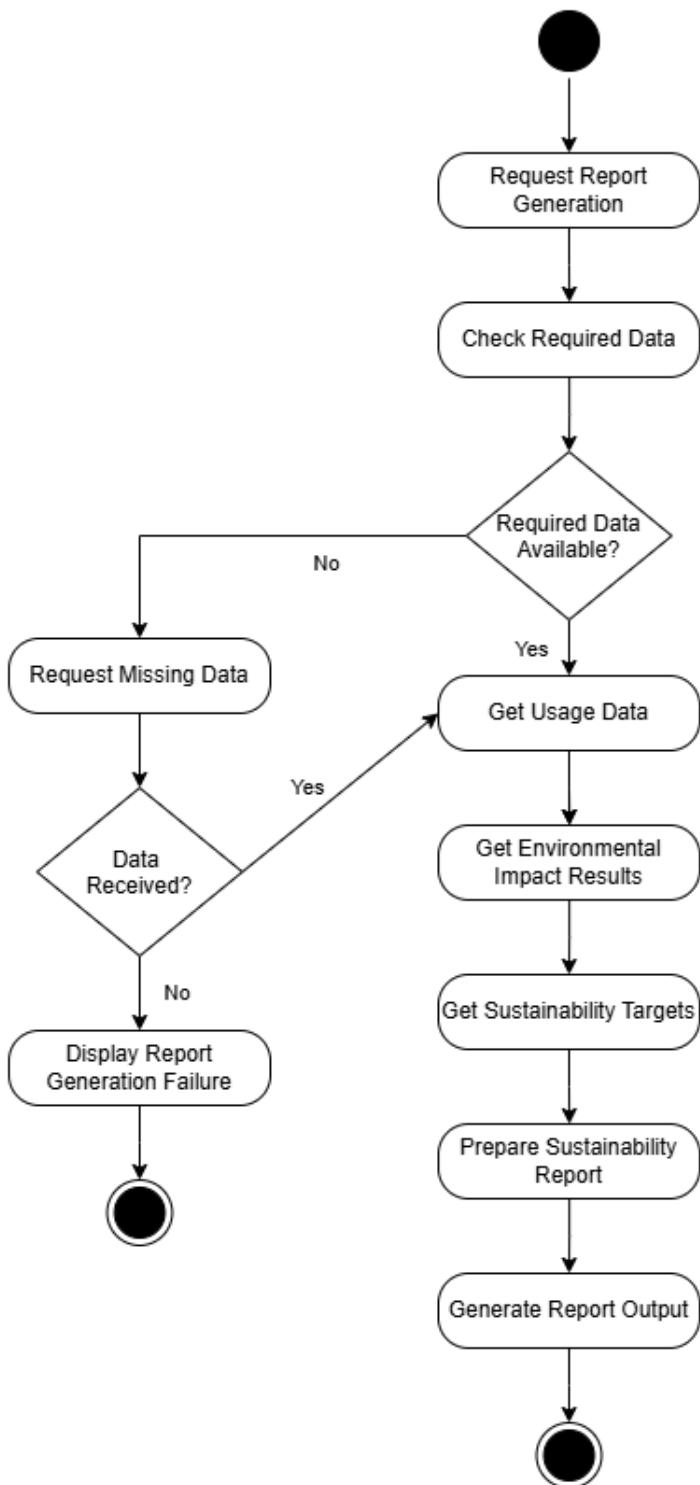
UML Diagrams are below :

# Resource Usage and Impact Analytics Platform



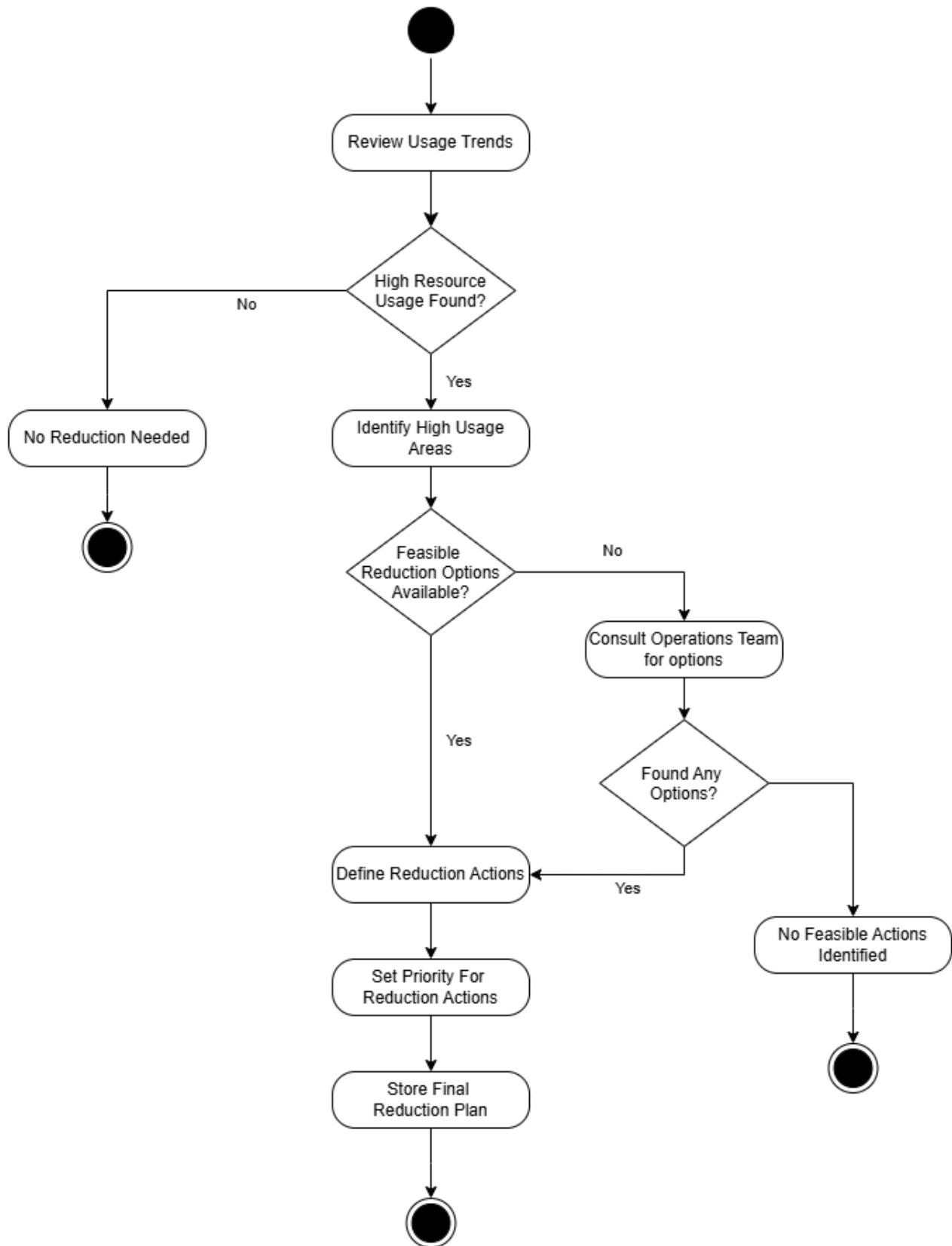
# Generate Sustainability Reports

(Sustainability Manager)

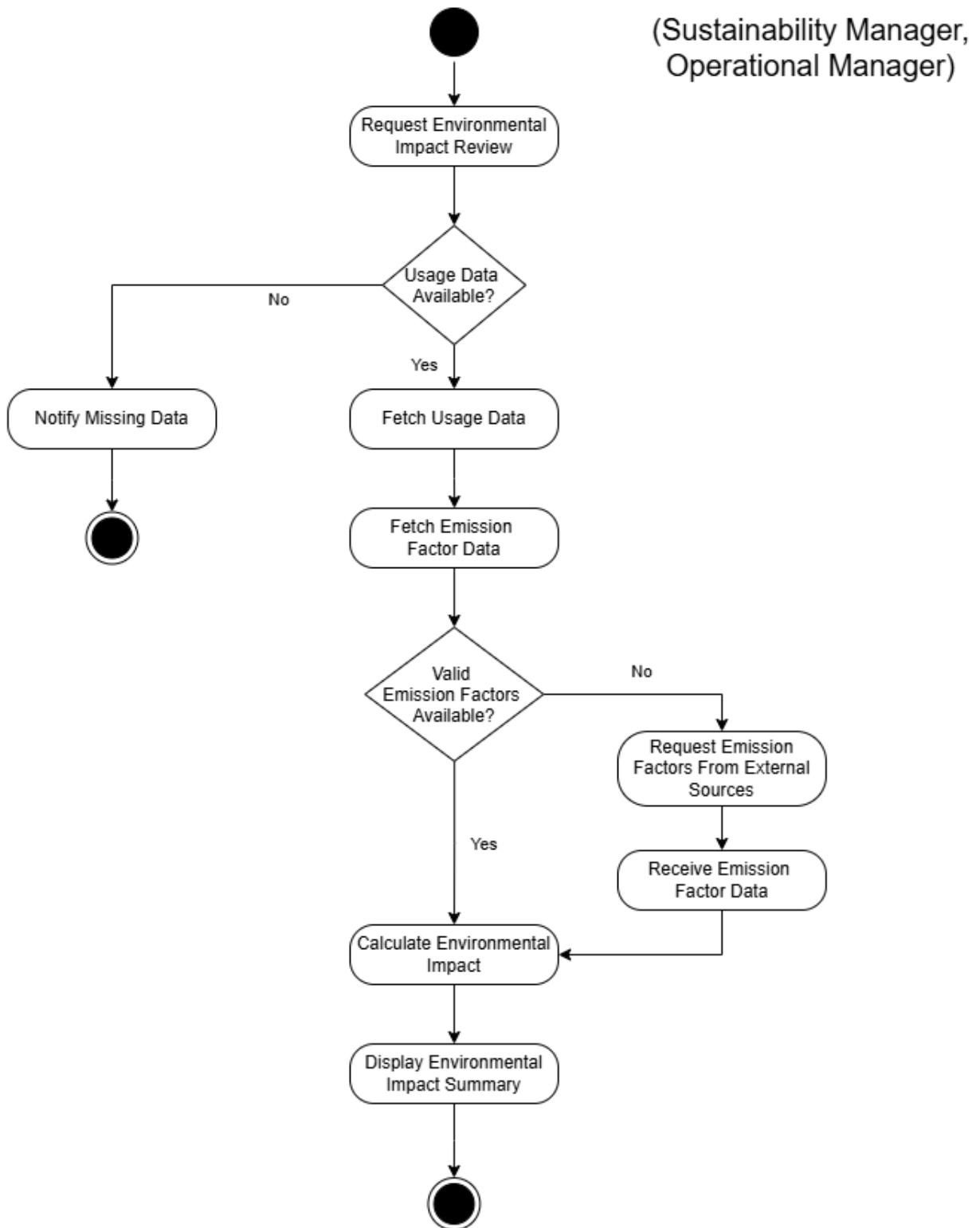


## Plan Resource Optimization Actions

(Operations Manager)

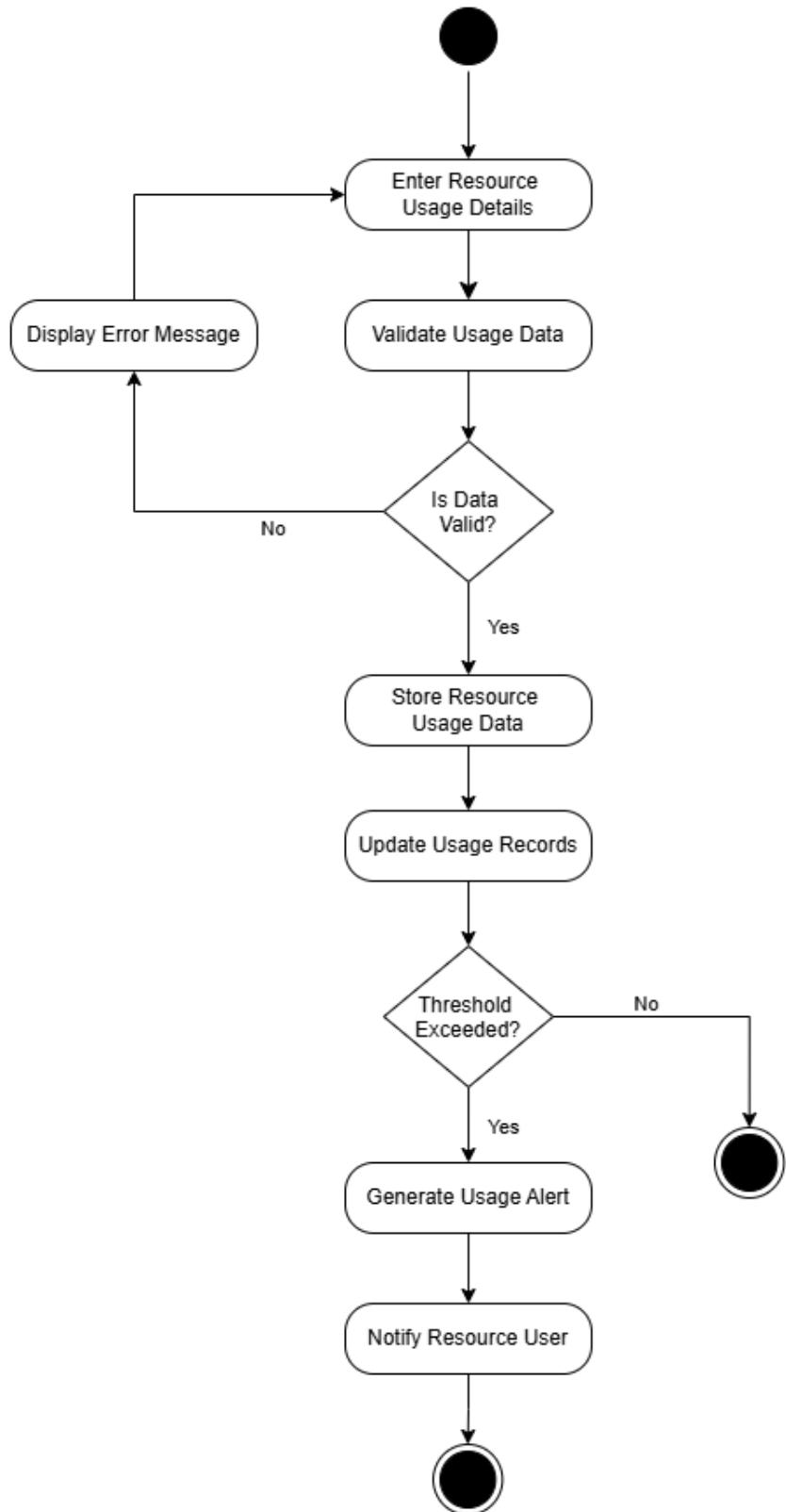


## Review Environmental Impact



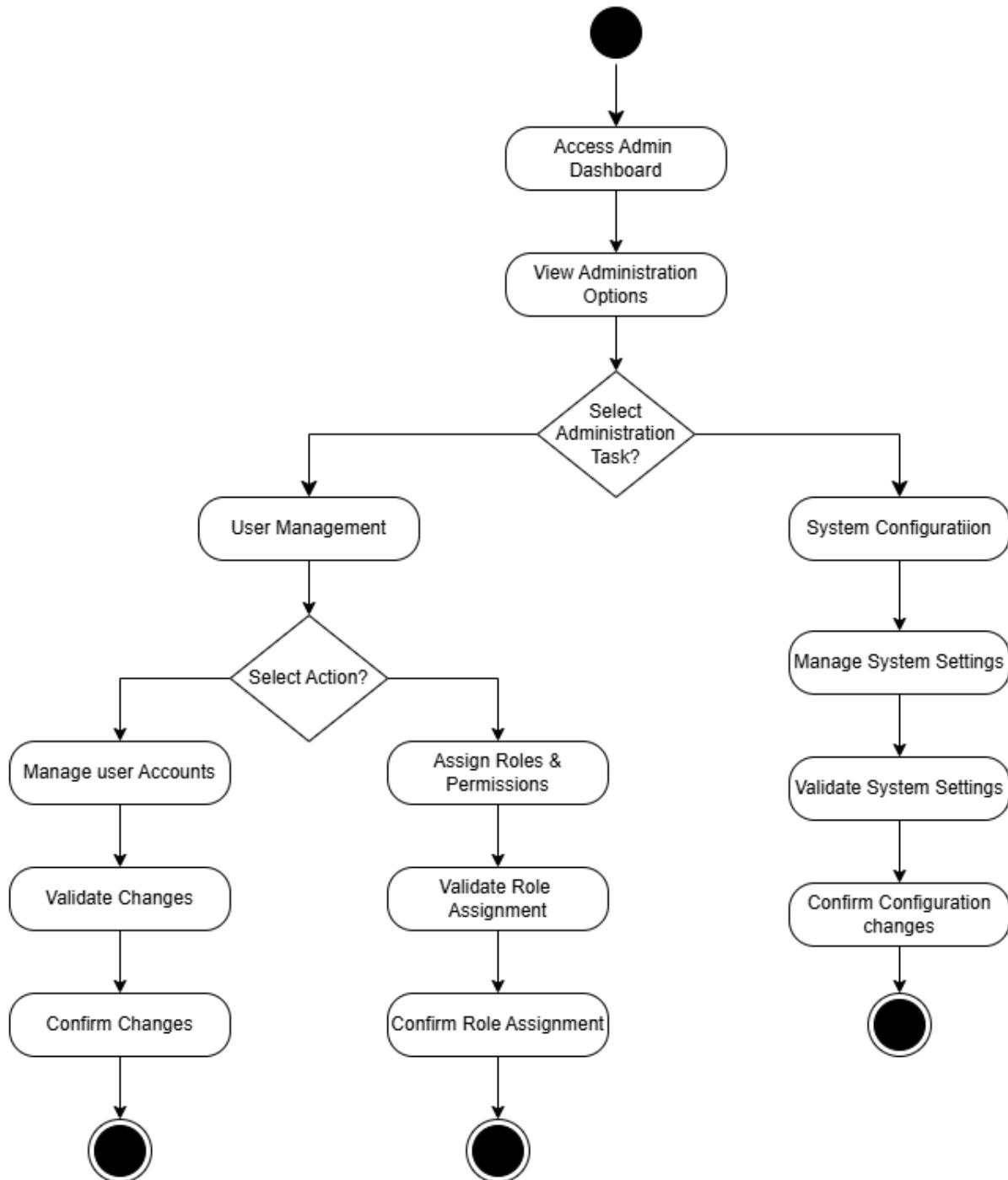
## Submit Resource Usage Data

(Resource User)



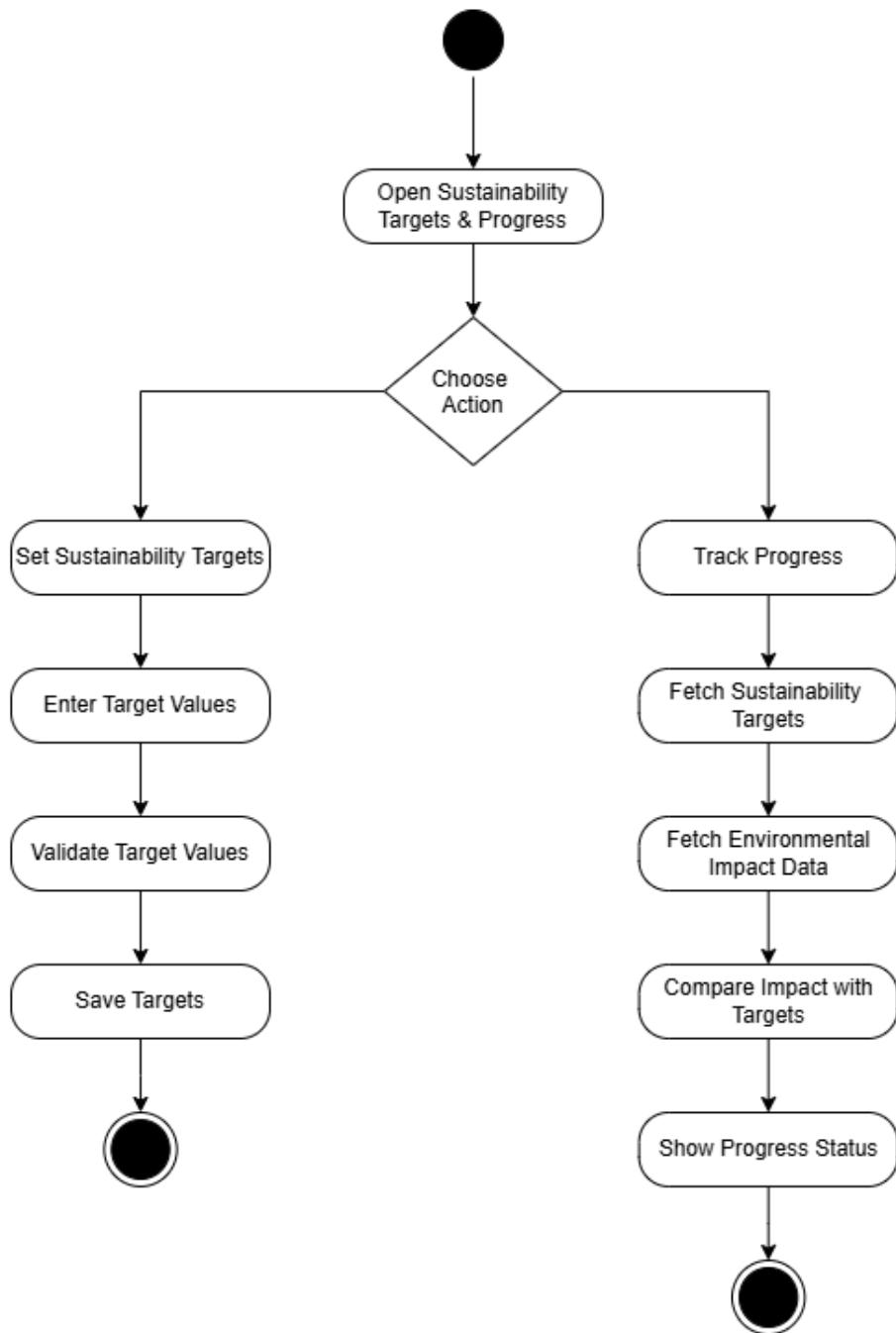
# System Administration

(System Administrator)



## Track Sustainability Targets & Progress

(Sustainability Manager)



## View Resource Usage & Consumption Trends

