

Project Proposal

On

POLLUTION MANAGEMENT SYSTEM

Guided By:-

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Created By:-

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PROJECT TITLE:

Pollution Management System (Terminal-Based)

Individual Participants role:



Lucky Kumar

- User
- Pollution Category



Manshi

- Pollution Readings
- Calculated Results



Rakhi

- Activity Log

INTRODUCTION

In today's time, we are facing mostly pollution problems. So, this project is to analyse pollution data generated from sources such as traffic, industries, waste burning and construction.

This project ensures accuracy, reduces manual work and helps to calculate pollution percentage (%) or levels or decision making.

It stores data like users, pollution sources and readings. Overall, it is a simple terminal - based project that demonstrate real world data handling and environmental monitoring.

OBJECTIVE

- To provide a system that stores pollution data reliably in a database.
- To allow users to insert, update, view and manage pollution readings.
- To calculate pollution levels in percentage.
- To improve efficiency in environmental data handling.
- To maintain proper records of pollution sources and readings.
- To contribute towards environmental awareness and cleaner surroundings.
- To build a scalable system for future enhancement.
- To make pollution monitoring easier and faster.

Project Category

- This project belongs to the Database Management System category.
- It is a terminal - based software application.

Analysis

➤ Modules and Description:

- **Module-1: User Authentication**

- 1.1 User Registration
- 1.2 User Login
- 1.3 User Update
- 1.4 User List
- 1.5 Delete User
- 1.6 Role based access (Admin/User)

- **Module-2: Pollution Category Management**

- 2.1 Add Pollution Category
- 2.2 View Category List
- 2.3 Category Details
- 2.4 Assign Standard Limit Value
- 2.5 Remove Pollution Category

- **Module-3: Pollution Reading Management**

- 3.1 Add Pollution Reading
- 3.2 Update Reading
- 3.3 View Reading List
- 3.4 Delete Reading
- 3.5 Reading Details (Category-wise/User-wise)

- **Module-4: Pollution Calculation and Result Management**

- 4.1 Fetch Standard Limit from Category
- 4.2 Calculate Pollution Percentage
- 4.3 Pollution Level (Safe/Moderate/Dangerous/Critical)
- 4.4 Store Result in Database
- 4.5 View Result List
- 4.6 Compare Results

- **Module-5: Activity Log & Reporting**

- 5.1 Record User Actions
- 5.2 View Log History
- 5.3 Filter Logs(User/Action/Date)
- 5.4 Generate Report
- 5.5 Final Pollution Report
- 5.6 Export

➤ Database Design:

- **Table-1: users**

| Fields | DataType | Properties |
|------------|-----------------------|----------------|
| user_id | varchar(30) | primary key |
| username | varchar(50) | not null |
| password | varchar(30) | not null |
| full_name | varchar(100) | not null |
| area | varchar(100) | not null |
| role | enum('admin', 'user') | not null |
| created_at | timestamp | auto generated |

Relationship:

- One user can have many pollution readings.
- One user can have many activity logs

- **Table-2: pollution_category**

| Fields | DataType | Properties |
|----------------|--------------|-------------|
| category_id | varchar(30) | primary key |
| category_name | varchar(100) | not null |
| description | varchar(400) | not null |
| standard_limit | double | not null |

Relationship

- One pollution source can have many readings

- **Table-3: pollution_readings**

| Fields | DataType | Properties |
|----------------|-------------|----------------------|
| reading_id | varchar(30) | primary key |
| category_id | varchar(30) | not null,foreign key |
| user_id | varchar(30) | not null,foreign key |
| emission_value | double | not null |
| reading_time | timestamp | auto generated |

Relationship:

- Many readings belongs to one pollution source
- Many readings belong to one user
- One reading has one calculated result

➤ User_pollutionReading table:

| Fields | datatype | properties |
|------------|-------------|-------------|
| user_id | varchar(30) | foreign key |
| reading_id | varchar(30) | foreign key |

➤ pollutionCategory_pollutionReading table:

| Fields | datatype | properties |
|-------------|-------------|-------------|
| category_id | varchar(30) | foreign key |
| reading_id | varchar(30) | foreign key |

• Table-4: calculated_results

| Fields | DataType | Properties |
|-------------------|--------------|----------------------|
| result_id | varchar(30) | primary key |
| reading_id | varchar(30) | not null,foreign key |
| pollution_percent | float | not null |
| pollution_status | varchar(100) | not null |
| calculated_on | timestamp | auto generated |

Relationship:

- One calculated result belongs to one reading(one-to-one).

➤ pollutionReading_calculatedResults table:

| Fields | datatype | properties |
|------------|-------------|-------------|
| reading_id | varchar(30) | foreign key |
| result_id | varchar(30) | foreign key |

• Table-5: activity_log

| Fields | Data Type | properties |
|-------------|--------------|-----------------------|
| log_id | varchar(30) | primary key |
| user_id | varchar(30) | not null, foreign key |
| action | varchar(500) | not null |
| action_time | timestamp | auto generated |

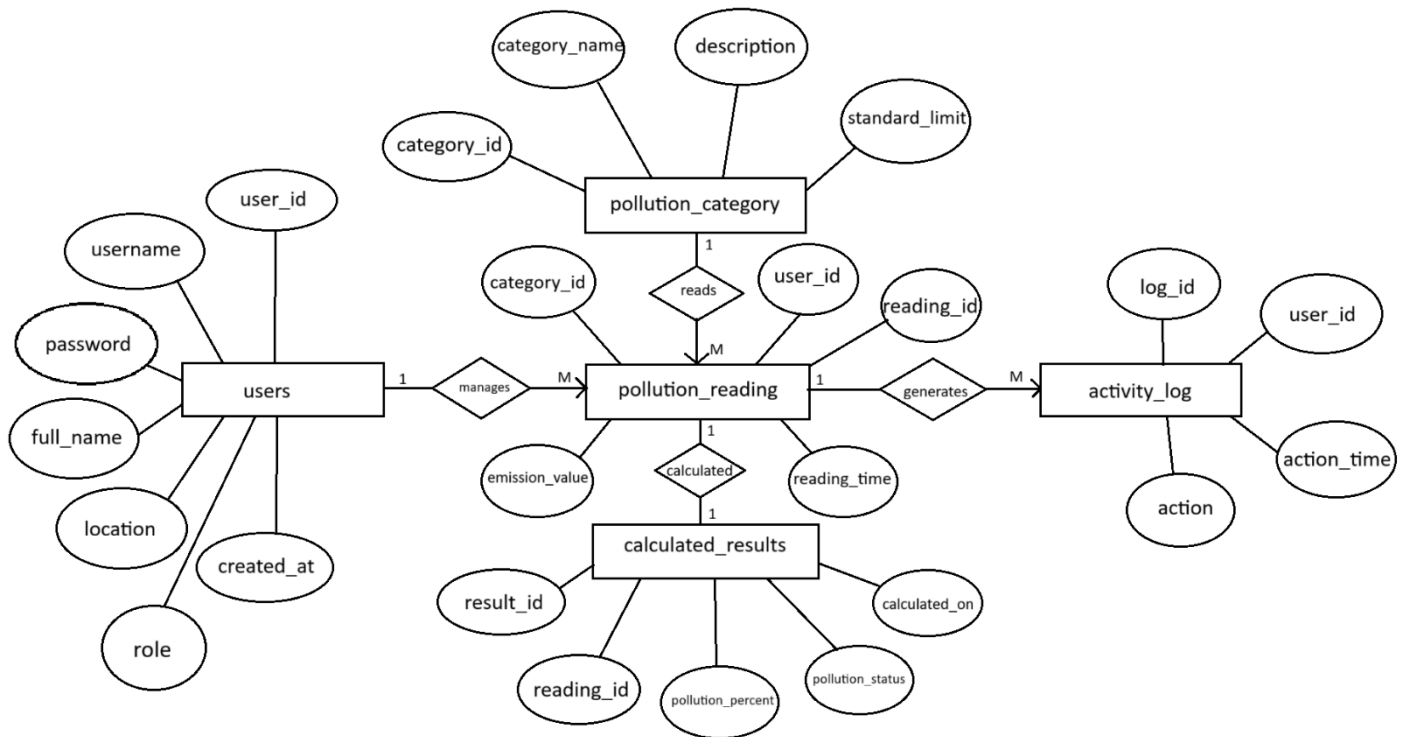
Relationship

- Many logs belong to one user.

➤ User_activityLog table:

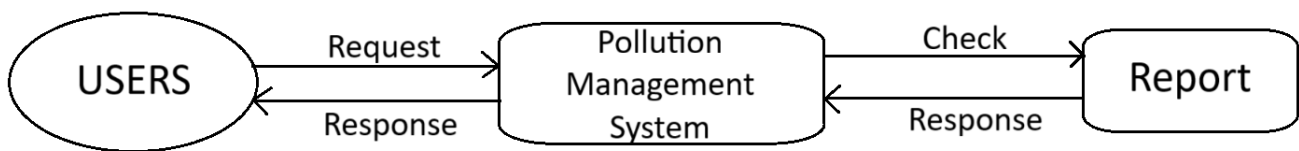
| Fields | datatype | properties |
|---------|-------------|-------------|
| user_id | varchar(30) | foreign key |
| log_id | varchar(30) | foreign key |

ENTITY RELATIONSHIP(ER) DIAGRAM

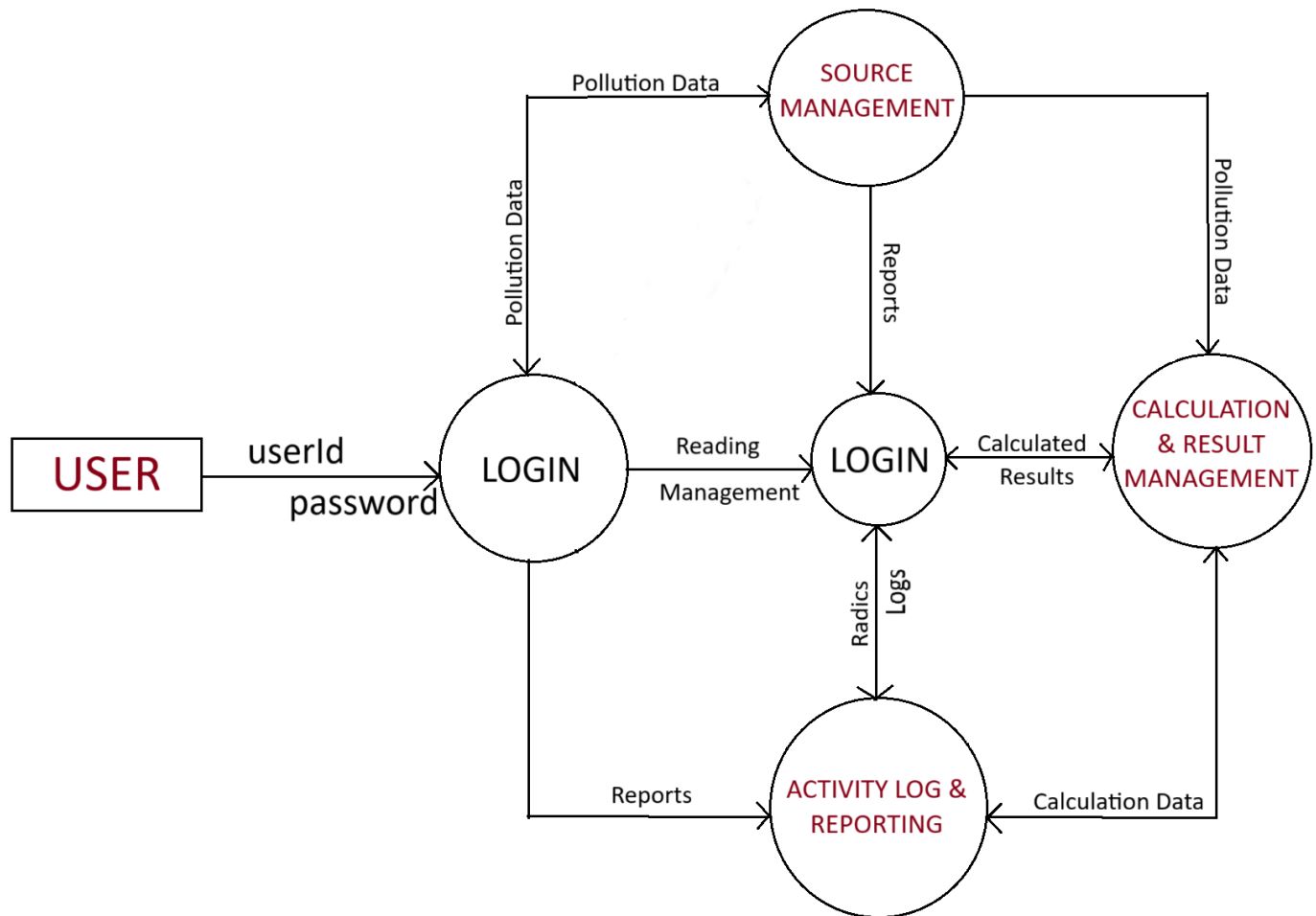


DATA FLOW DIAGRAM

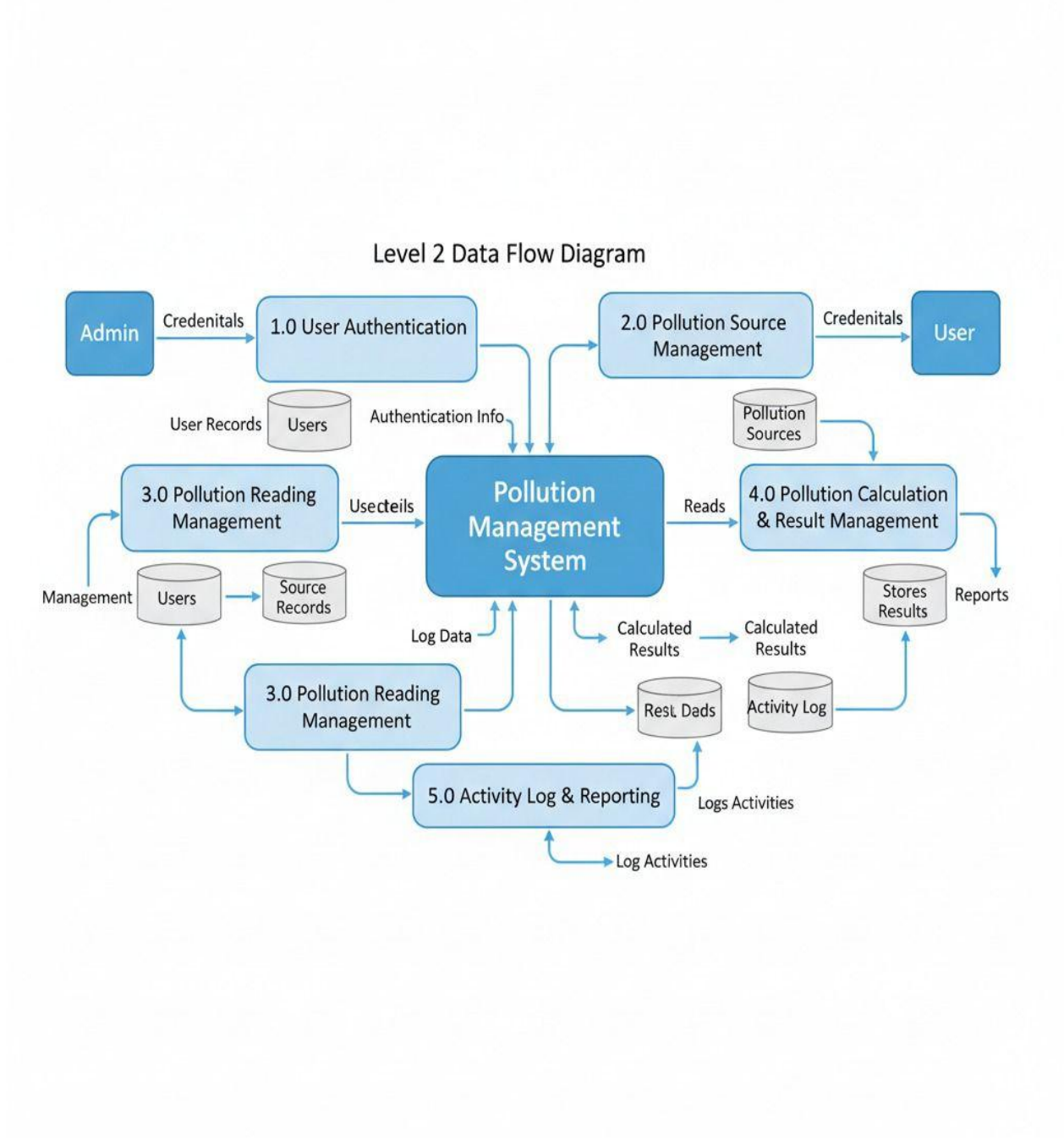
0-level DFD:-



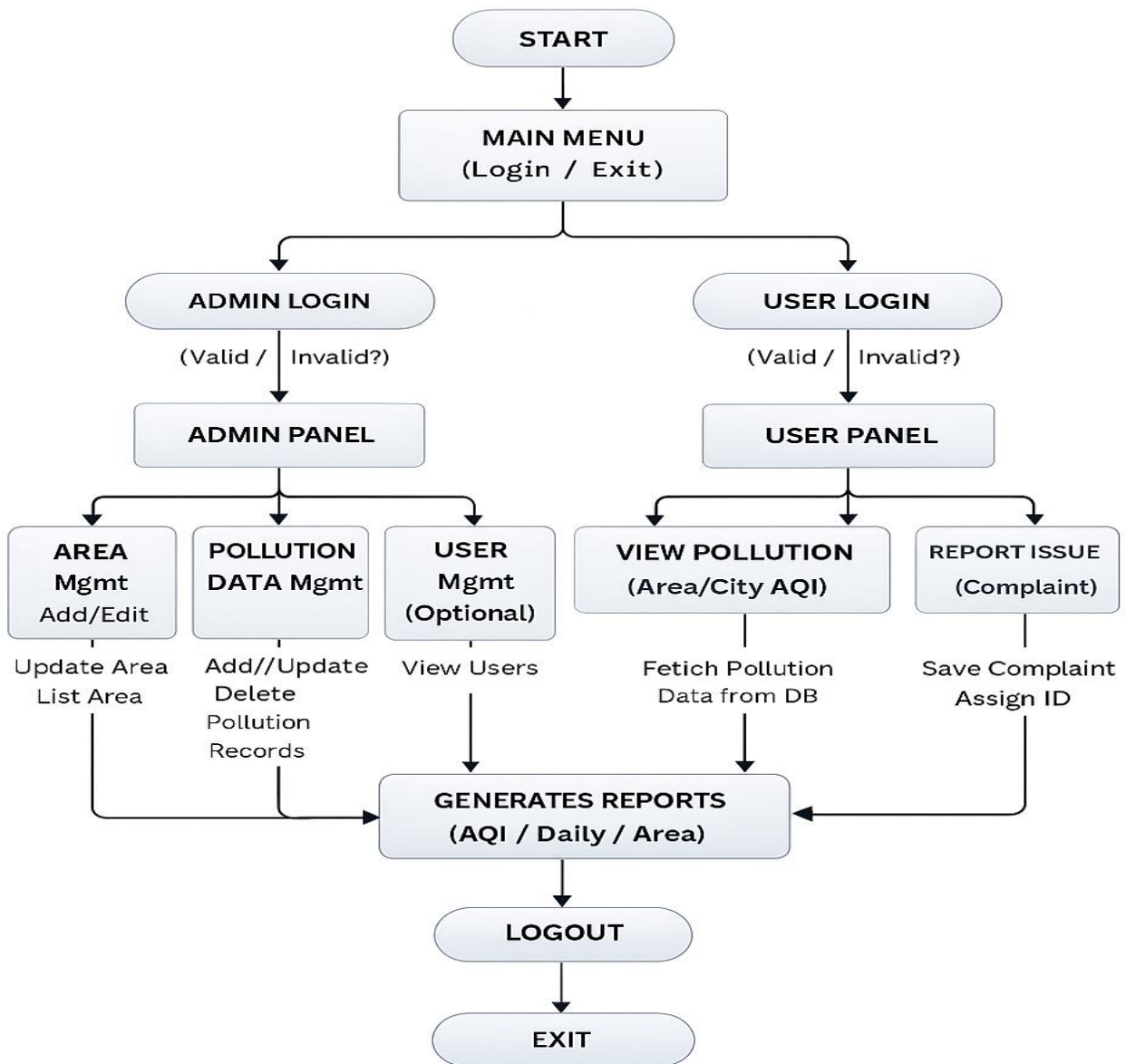
1-level DFD:-



2-level DFD:-



➤ Process Logical Diagram



Logical Process Flow



PLATFORM USED

➤ HARDWARE REQUIREMENTS:-

- Processor: Intel i5
- RAM: 4GB min
- Hard Disk: min 2GB free space

➤ SOFTWARE REQUIREMENTS:-

- JDK
- Eclipse IDE
- MySQL

FUTURE SCOPE

- Live pollution data intergration
- Adding a Graphical User Interface (GUI) for better user experience.
- Location based tracking
- Waste and noise modules
- Automatic report generation

BIBLIOGRAPHY

• WEB Resources:-

1. Oracle Java Documentation
2. MySQL official documentation
3. JDBC API Guide
4. Reference books on DBMS and Java Programming
5. Online educational resources (GeeksforGeeks, TutorialsPoint, JavaTPoint)