

Project Proposal

On

POLLUTION MANAGEMENT SYSTEM

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PROJECT TITLE:

Pollution Management System (Terminal-Based)

Using Java, JDBC, MySQL

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.
- Core Java is used as the primary level programming language.
- Java Database Connectivity is used to connect Database with Java.
- MySQL is used as the Relational Database Management System.
- It demonstrates CRUD (i.e., CREATE, READ, UPDATE, DELETE) operations.

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
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	DataType	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

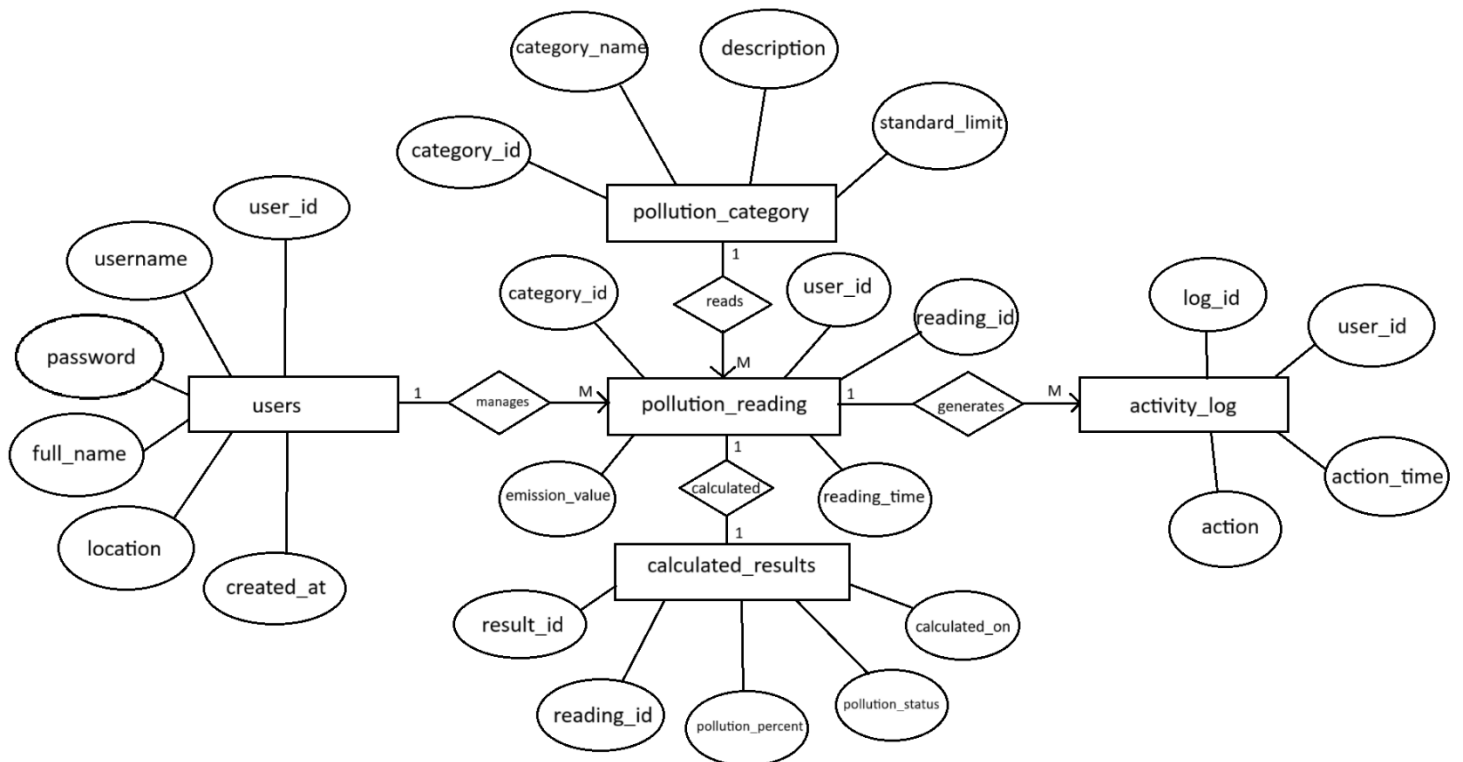
Relationship

- Many logs belong to one user.

➤ User_activityLog table:

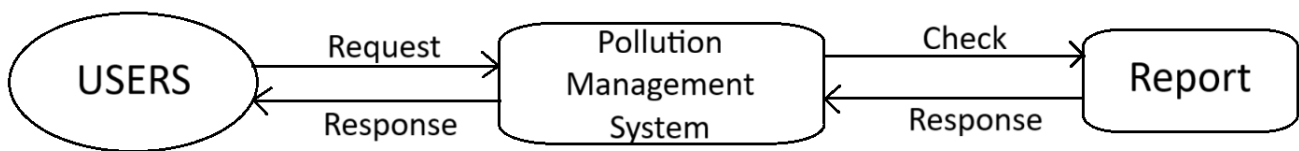
Fields	datatype	properties
user_id	varchar(30)	foreign key
log_id	varchar(30)	foreign key

ENTITY RELATIONSHIP(ER) DIAGRAM

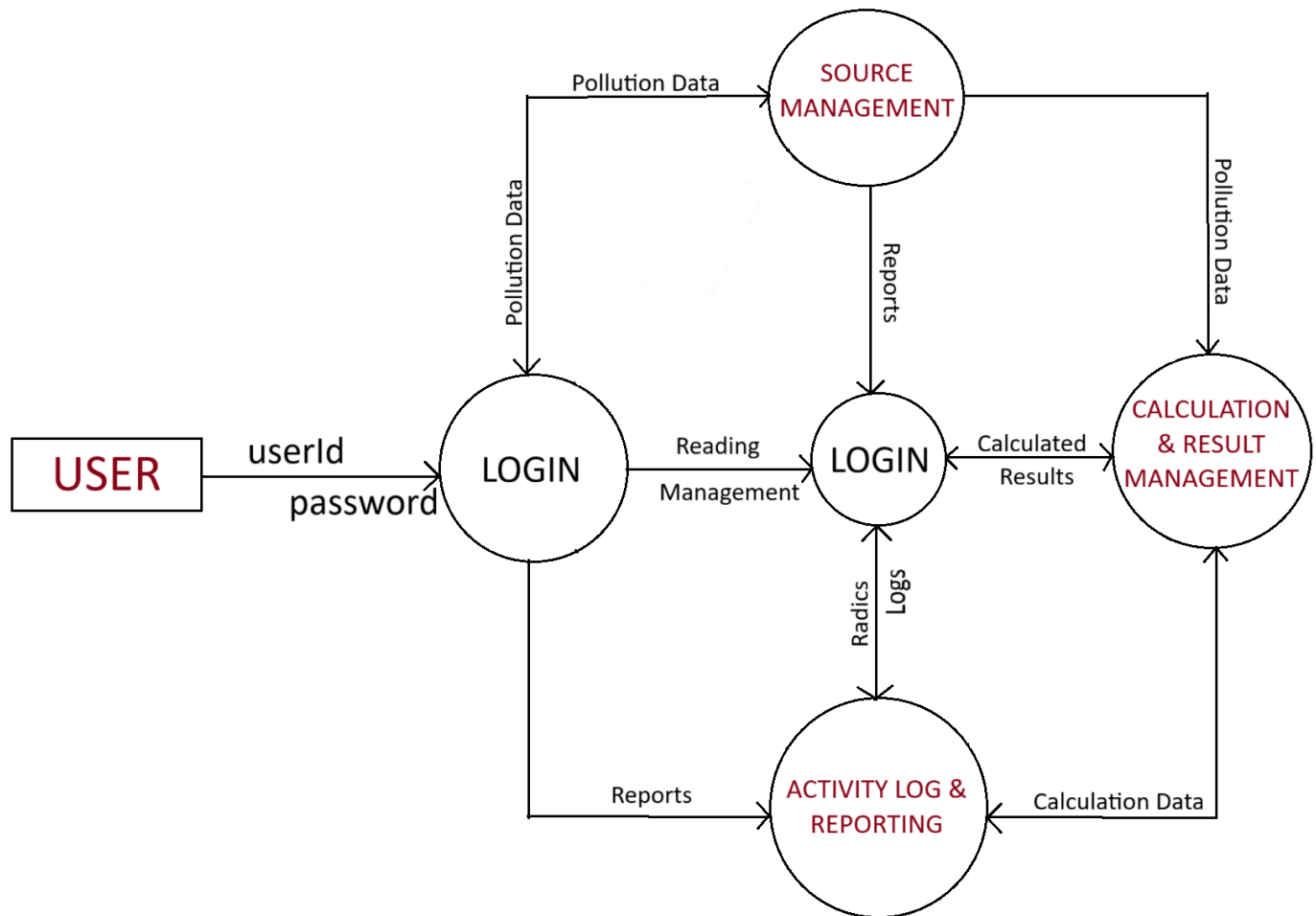


DATA FLOW DIAGRAM

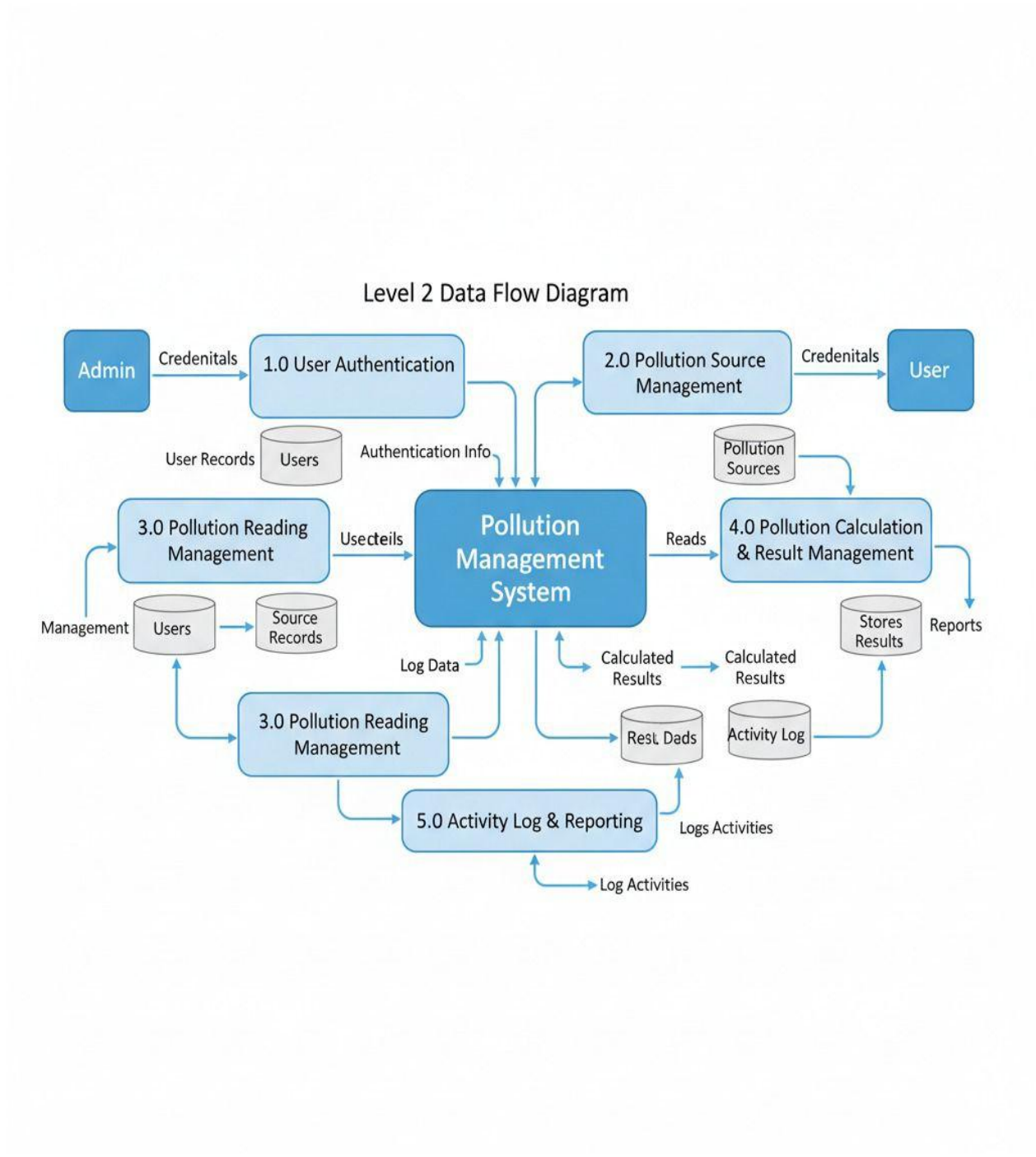
0-level DFD:-



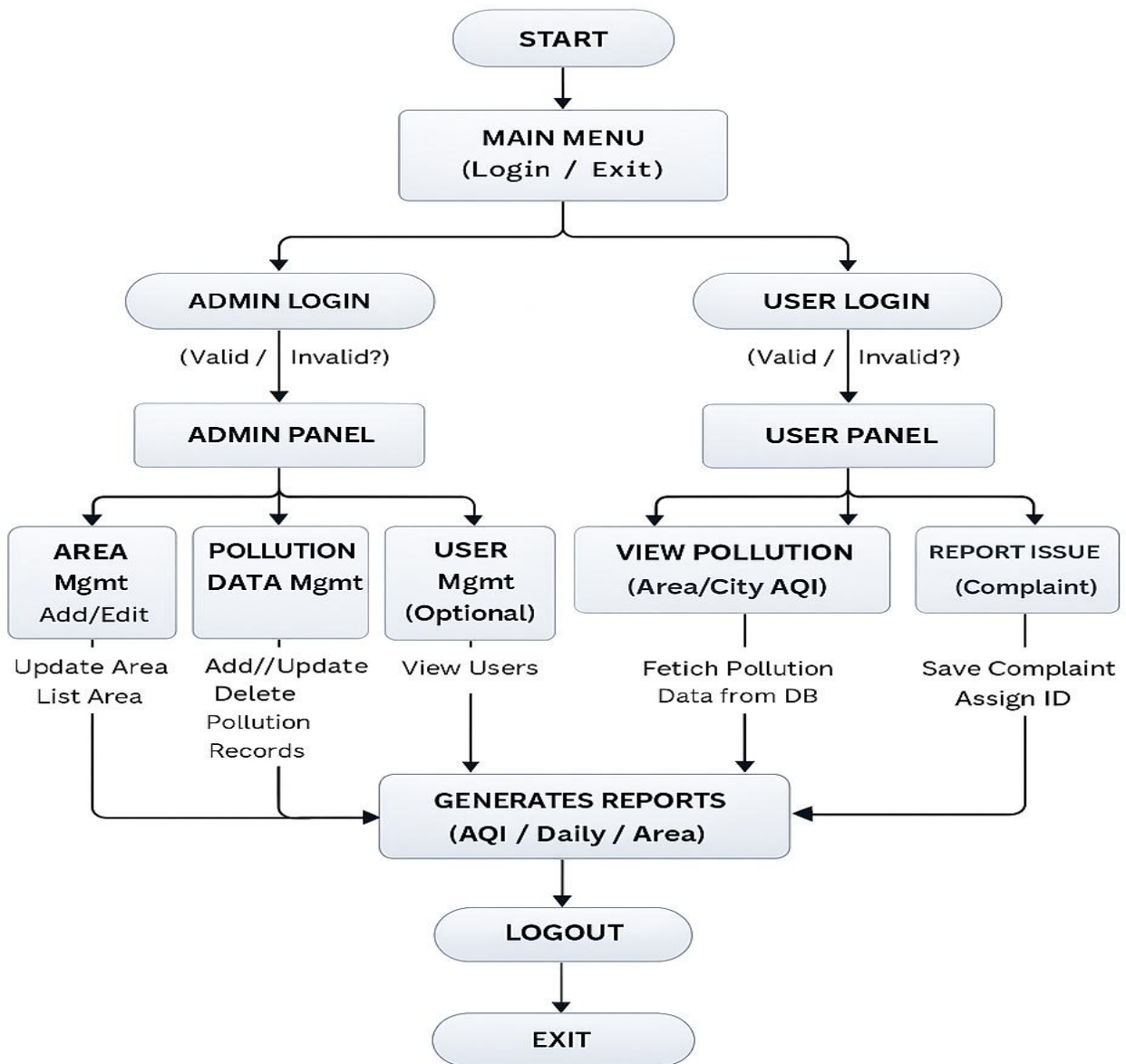
1-level DFD:-



2-level DFD:-



➤ Process Logical Diagram



Logical Process Flow



PLATFORM USED

➤ **HARDWARE REQUIREMENTS:-**

- Processor: Intel i5
- RAM: 4GB min
- Hard Disk: 500 free space

➤ **SOFTWARE REQUIREMENTS:-**

- JDK17
- Eclipse IDE
- MySQL Server

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)