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College of Informatics and Computing Sciences

MDRRMO DREAMS: Disaster Response and Emergency Aid Management System

Final Project Documentation

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Course:
IT211 Database Management System

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Introduction

Project Title

MDRRMO DREAMS: Disaster Response and Emergency Aid Management System

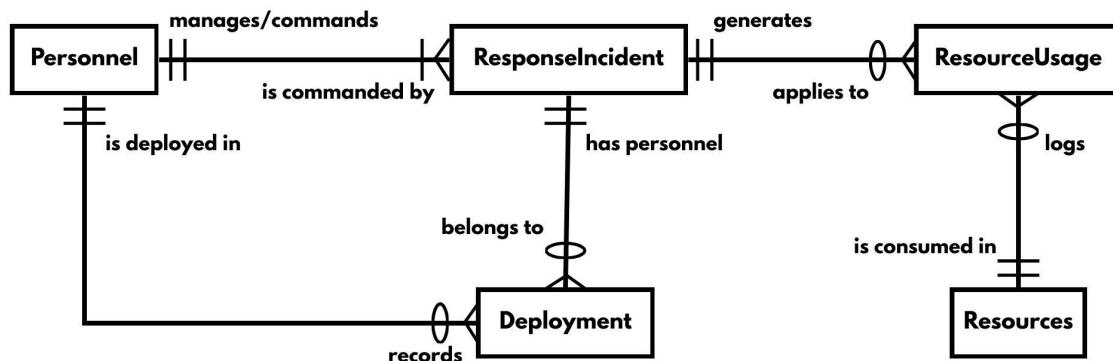
Project Objectives

The primary goal of this project was to design, implement, and integrate a relational database system to manage the core operations of a Municipal Disaster Risk Reduction and Management Office. This was achieved by:

- Designing a five-table, normalized database schema that captures the complex relationships between personnel, incidents, and resources.
- Developing a Python/Tkinter Graphical User Interface (GUI) that connects securely to the MySQL database.
- Implementing full CRUD (Create, Read, Update, Delete) functionality across all core data entities.
- Generating complex analytical reports that utilize JOIN operations across bridge tables to retrieve meaningful operational insights.

Database Schema and Design

Entity-Relationship Diagram (ERD)





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Table Structure and Relationships

The system is built on 5 tables, designed to achieve Third Normal Form (3NF) by eliminating transitive dependencies and managing many-to-many relationships via bridge tables.

Table Name	Primary Key	Key Fields	Relationships
Personnel	personnel_id	name, role, specialty	1:M to ResponseIncidents
Resource	resource_id	item_name, category, stock_level	1:M to ResourceUsage
ResponseIncidents	incident_id	incident_type, incident_location, status	1:M to Deployment and ResourceUsage
Deployment	personnel_id, incident_id	deployment_time, role_during_incident	M:M Bridge between Personnel and Incidents
ResourceUsage	usage_id	quantity_used, date_used	M:M Bridge between Resources and Incidents



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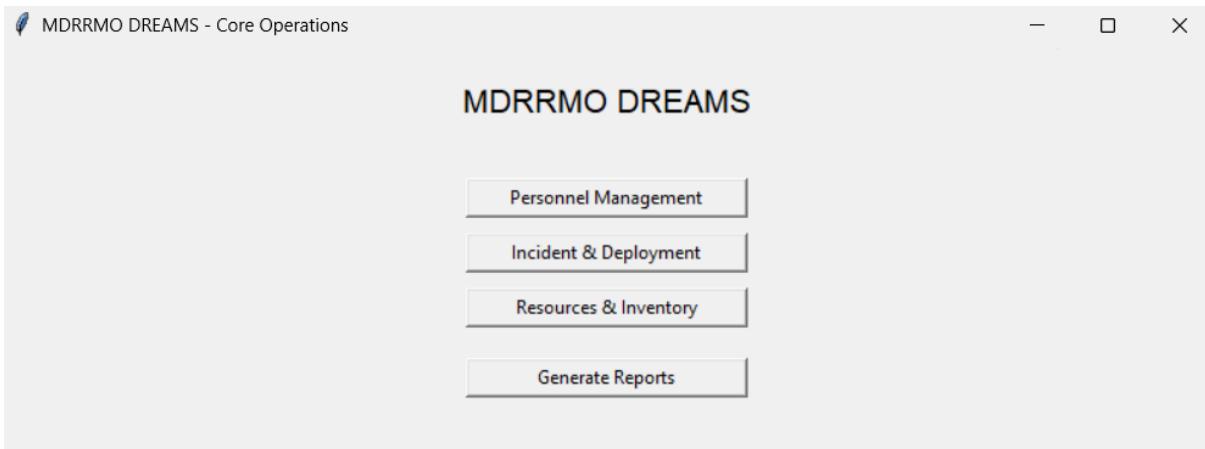
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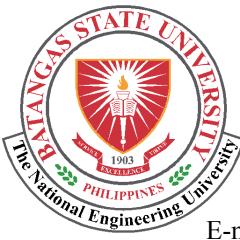
GUI Implementation and Key Features

Main Navigation Window



Core CRUD Functionality

ID	Name	Role	Specialty	Contact No.	Unit
1	Ramos, Crispin S.	Commander	Logistics	09171234567	Operations
2	De Guzman, Maria A.	Logistics Officer	Procurement	09199876543	Admin
3	Cruz, John M.	Rescuer	Medical	09202025128	Operations
4	Santos, Anna R.	Rescuer	Search & Rescue	09324443333	Operations



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Complex Interactivity and Stock Management

Resources & Inventory Management

Add/Edit Resource Inventory

Item Name:

Category:

Stock Level:

Unit:

Current Inventory

ID	Item Name	Category	Stock	Unit
1	Ambulance 01	Vehicle	1	Unit
4	Bottled Water	Relief Goods	500	Bottle
2	First Aid Kits	Medical Supplies	30	Box
3	Rope, 100m Rescue	Equipment	5	Roll

Log Usage Against Incident:

ID 3: Flooding/Rescue

Resource Consumed:

Ambulance 01

Quantity Used:

LOG RESOURCE USAGE

Resource Usage History

ID	Incident ID	Resource	Qty Used
4	3	Bottled Water	100
3	3	Rope, 100m Rescue	1
2	1	First Aid Kits	2
1	1	Ambulance 01	1

Analytical Reporting

DREAMS Reporting & Analytics

DREAMS Analytical Reports

Incident Performance Personnel Utilization Resource Consumption Detail Low-Stock Inventory Alert Incidents Lacking Resource Logs

Personnel Utilization

Personnel Name	Specialty	Incident Type	Deployment Time	Role
Santos, Anna R.	Search & Rescue	Flooding/Rescue	2025-12-06 14:06:00	Lead Rescuer
Ramos, Crispin S.	Logistics	Flooding/Rescue	2025-12-06 14:05:00	Incident Command
Santos, Anna R.	Search & Rescue	Medical Emergency	2025-12-06 10:35:00	Driver/Support
Cruz, John M.	Medical	Medical Emergency	2025-12-06 10:35:00	On-Site Commander
Cruz, John M.	Medical	Road Accident	2025-12-06 08:06:00	Paramedic
Ramos, Crispin S.	Logistics	Road Accident	2025-12-06 08:05:00	Incident Command



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Reflection and Conclusions

Reflection on Design and Implementation

The transition from the conceptual schema to the working application demonstrated the necessity of robust Foreign Key (FK) constraints. For example, the system logic had to explicitly manage the FK dependencies during the Delete operations (e.g., deleting an incident requires first deleting related records in Deployment and ResourceUsage).

The most challenging but rewarding implementation was the Resource Usage Log. This required a single Python function (`log_resource_usage`):

1. Retrieve the current stock level.
2. Validate if the quantity used exceeds stock (preventing invalid data).
3. Insert the usage record into ResourceUsage.
4. Update the remaining stock_level in the Resources table.

This successfully proved the system's ability to maintain data integrity and perform complex transaction-like operations in real-time.

Conclusion

MDRRMO DREAMS successfully met all project objectives. It is a functional, user-friendly application built upon a solid relational foundation. The ability to perform standard operational management (CRUD) alongside complex analytical reporting provides a valuable tool for effective disaster response and resource planning. The final product confirms a strong understanding of database design, SQL integration, and system development principles.