Municipal Complaint Management System – Milestone 2 Report

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# 1. Relational Schema

The following tables represent the relational schema for the Municipal Complaint Management System:

## Citizen Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 |
| Citizen\_ID (PK) | Name | Address | Email | Phone |

## Complaint Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 | Column 6 |
| Complaint\_ID (PK) | Citizen\_ID (FK) | Complaint\_Type | Description | Date | Status |

## Department Table

|  |  |  |
| --- | --- | --- |
| Column 1 | Column 2 | Column 3 |
| Dept\_ID (PK) | Dept\_Name | Dept\_Head |

## Employee Table

|  |  |  |  |
| --- | --- | --- | --- |
| Column 1 | Column 2 | Column 3 | Column 4 |
| Emp\_ID (PK) | Dept\_ID (FK) | Name | Position |

## Complaint\_Assignment Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Column 1 | Column 2 | Column 3 | Column 4 | Column 5 |
| Assignment\_ID (PK) | Complaint\_ID (FK) | Emp\_ID (FK) | Assignment\_Date | Resolution\_Date |

# 2. Normalization to 3NF

## Unnormalized Form (UNF)

In the unnormalized form, data can have multivalued or composite attributes. For instance, a Citizen can have multiple complaints recorded in a single field.  
Example: Citizen(Citizen\_ID, Name, Address, Email, Phone, [Complaints])

## First Normal Form (1NF)

To achieve 1NF, multivalued attributes are separated into different records or tables.  
Citizen(Citizen\_ID, Name, Address, Email, Phone)  
Complaint(Complaint\_ID, Citizen\_ID, Complaint\_Type, Description, Date, Status)

## Second Normal Form (2NF)

To reach 2NF, we remove partial dependencies. Since all our tables have a single-field primary key, there are no partial dependencies.  
Thus, our schema is already in 2NF.

## Third Normal Form (3NF)

To achieve 3NF, transitive dependencies are removed. For example, Department Head is dependent on Dept\_ID and should remain in the Department table.  
All other dependencies are direct and each non-key attribute depends only on the primary key of its table.

# 3. Keys and Dependencies

Below are the primary keys and foreign key dependencies for each table:  
  
- Citizen Table:  
 - Primary Key: Citizen\_ID  
 - No foreign keys  
  
- Complaint Table:  
 - Primary Key: Complaint\_ID  
 - Foreign Key: Citizen\_ID references Citizen(Citizen\_ID)  
  
- Department Table:  
 - Primary Key: Dept\_ID  
 - No foreign keys  
  
- Employee Table:  
 - Primary Key: Emp\_ID  
 - Foreign Key: Dept\_ID references Department(Dept\_ID)  
  
- Complaint\_Assignment Table:  
 - Primary Key: Assignment\_ID  
 - Foreign Keys: Complaint\_ID references Complaint(Complaint\_ID), Emp\_ID references Employee(Emp\_ID)

# 4. Conclusion

In this milestone, we successfully converted the conceptual ER model of the Municipal Complaint Management System into a relational schema.  
We applied normalization techniques up to 3NF to ensure data integrity, reduce redundancy, and improve database efficiency.  
The relational schema now provides a solid foundation for implementation in any relational database system.

# 5. References

1. Class lecture notes and provided course materials.

2.The content and guidence were developed with the assistance of ChatGpt, an AI language model by open AI.