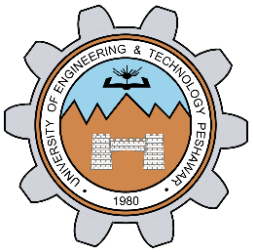
KEY MILESTONE 2: NORMALIZED RELATIONAL SCHEMA

KAZ KITCHEN RESERVATION SYSTEM



Spring 2025

CSE-403L Database Management System Lab

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May 25, 2025

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KAZ KITCHEN RESERVATION SYSTEM

INTRODUCTION

The KAZ Kitchen Reservation System is a database-driven application designed to efficiently streamline and manage table reservations for a restaurant. The primary objective of this project is to digitize the reservation process, replacing traditional manual methods with a reliable and structured system that ensures accuracy, reduces overbooking, and enhances customer experience.

This system enables customers to create accounts, book tables based on availability, and, optionally, request special services, such as decorations. It ensures that each table is reserved for a specific time slot, avoids double bookings, and provides flexibility in managing cancellations.

ENTITY RELATIONSHIP DIAGRAM (ERD)

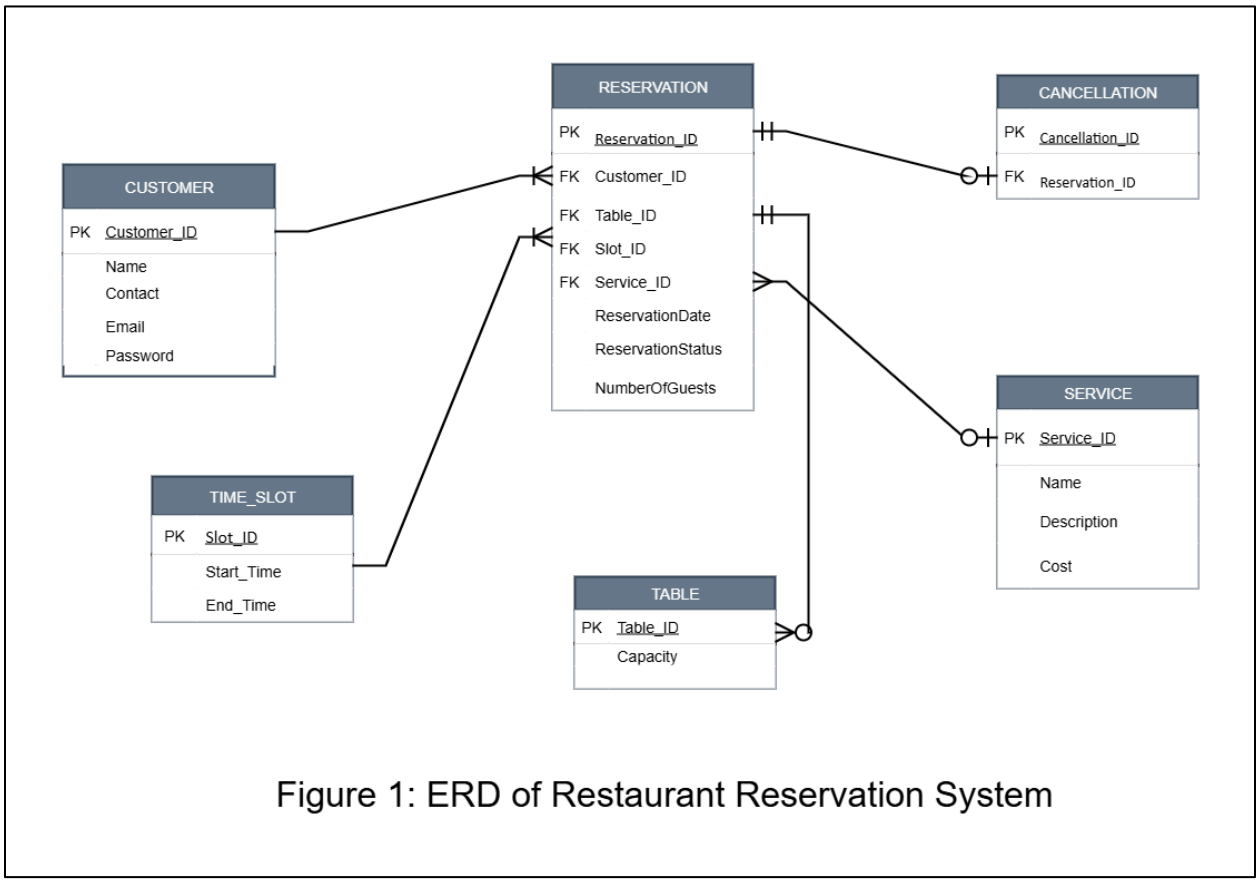
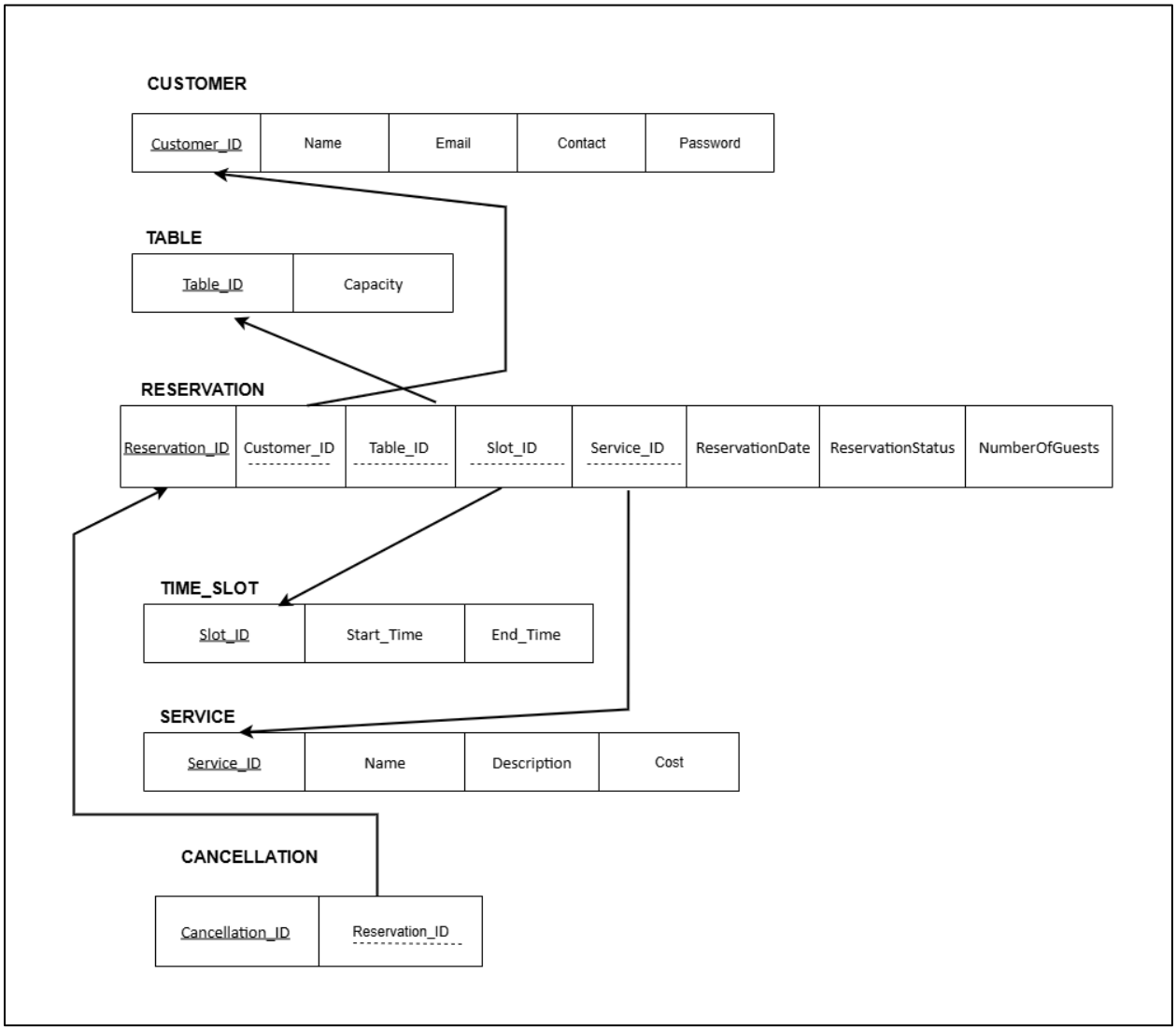


Figure 1: ERD of Restaurant Reservation System

RELATIONAL SCHEMA



NORMALIZATION TO 3NF

Each of the following relations has been analyzed to ensure it meets the requirements of the Third Normal Form (3NF).
This involves verifying that each non-key attribute is fully functionally dependent on the primary key, and that there are no transitive dependencies.

1. **CUSTOMER**
   - **1NF**: All fields are atomic.
   - **2NF**: Only one primary key (Customer_ID), so no partial dependencies.
   - **3NF**: No transitive dependencies.
     Already in 3NF

2. **TABLE**
   - **1NF**: all fields are atomic.
   - **2NF**: Single primary key (Table_ID), so no partial dependencies.
   - **3NF**: Capacity depends only on Table_ID.
     Already in 3NF

3. **TIME_SLOT**
   - **1NF**: Atomic fields.
   - **2NF**: Single key, so no partial dependencies.
   - **3NF**: No transitive dependencies.
     Already in 3NF

4. **SERVICE**
   - **1NF**: Atomic fields.
   - **2NF**: Single PK, so no partial dependency.
   - **3NF**: No transitive dependency.
     Already in 3NF

5. **RESERVATION**
   - **1NF**: All fields are atomic.
   - **2NF**: Reservation_ID is the primary key, and all non-key attributes depend entirely on it.
   - **3NF**: No transitive dependency among non-key attributes.
     Already in 3NF

6. **CANCELLATION**
   - **1NF**: Atomic fields.
   - **2NF**: Single PK (Cancellation_ID), so no partial dependency.
   - **3NF**: No transitive dependency.
     Already in 3NF

CONCLUSION

The normalization process for the KAZ Kitchen Reservation System has been completed up to the Third Normal Form (3NF). Each relation—Customer, Table, Time_Slot, Service, Reservation, and Cancellation—was thoroughly analyzed to ensure that it adheres to the principles of data integrity, minimal redundancy, and logical consistency.

By applying normalization techniques, we have ensured that all attributes in each table are fully functionally dependent on their respective primary keys and free from partial or transitive dependencies.