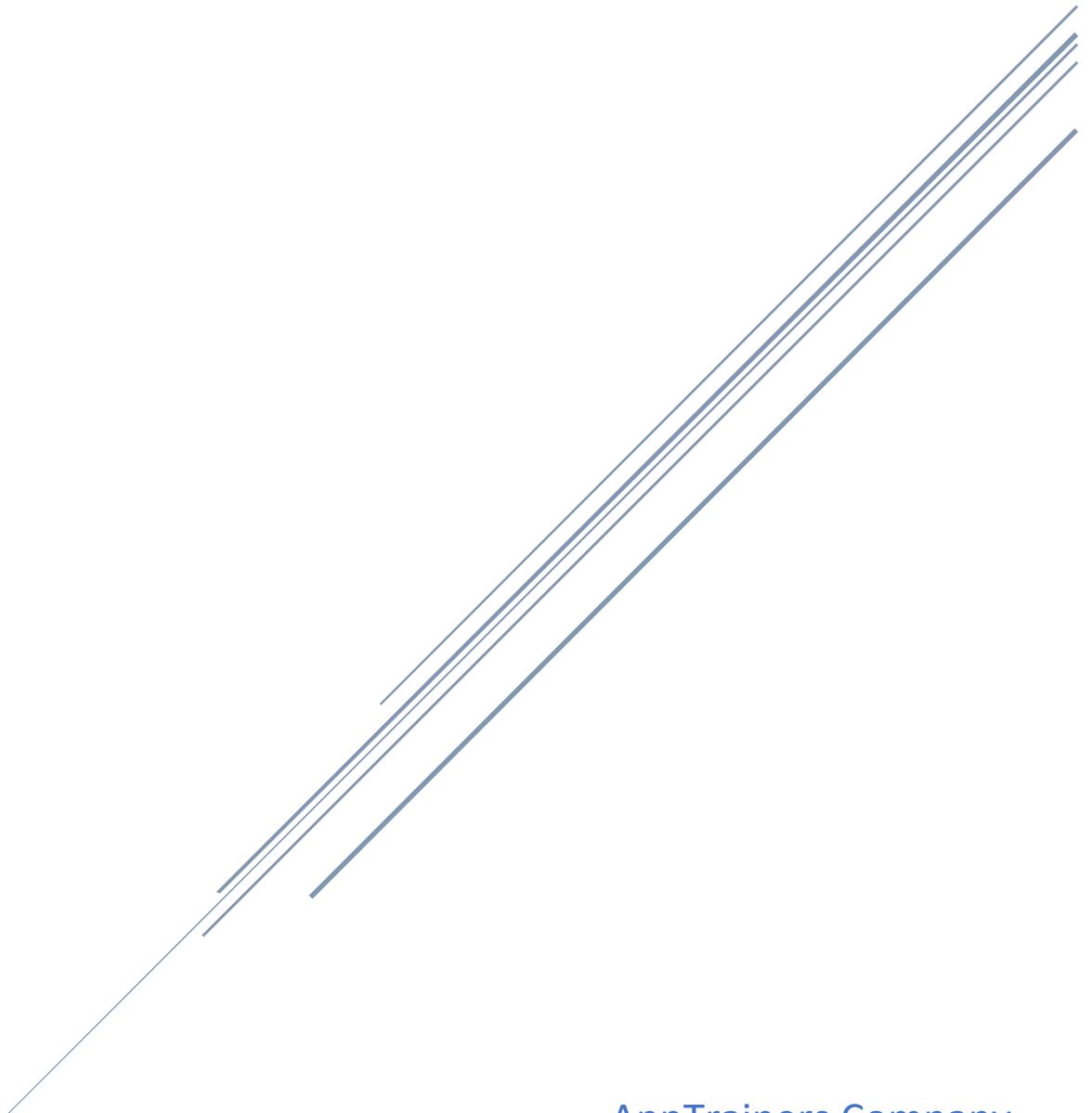


RESTAURANT MANAGEMENT SYSTEM

Database Project



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Abstract

The E-Restaurant Management System is a comprehensive database-driven application designed to streamline restaurant operations, enhance customer experience, and optimize staff management. The system incorporates key functionalities such as menu management, reservations, order processing, staff attendance tracking, and customer feedback collection.

A relational database schema is implemented to ensure data integrity and efficient storage, utilizing lookup tables to manage dynamic attributes like person roles, cities, nationalities, and menu categories. The system enforces referential integrity using foreign keys and constraints, preventing data inconsistencies.

To facilitate operational efficiency, various views are created to generate reports on available menu items, daily reservations, and sales summaries. Additionally, stored procedures automate critical processes such as order placement, reservation management, staff performance tracking, and menu availability updates.

The system ensures a seamless experience for customers through real-time reservation tracking, order management linked to customer profiles, and an intuitive feedback mechanism. For restaurant staff, attendance tracking and role-based access provide operational control and performance evaluation.

This project is an essential tool for modern restaurants, enhancing efficiency, reducing manual workload, and improving decision-making through well-structured data management and automation.

Introduction

In today's fast-paced digital world, restaurant management systems play a crucial role in ensuring smooth business operations. Traditional methods of handling menu management, reservations, order processing, and staff attendance tracking are often time-consuming, prone to errors, and inefficient. The E-Restaurant Management System is designed to modernize these processes by providing an integrated database solution that improves restaurant efficiency, enhances customer experience, and optimizes staff performance.

This system utilizes a relational database model to ensure data integrity and efficient management of restaurant operations. It includes key features such as menu item categorization, customer reservations, order processing, staff attendance tracking, and customer feedback management. The system enforces business rules through foreign key constraints, stored procedures, and views to automate key processes, such as checking for double-booked reservations and calculating order totals.

The primary objective of this project is to enhance operational efficiency, reduce human errors, and improve customer satisfaction through well-structured data management and automation. By implementing stored procedures for handling orders and reservations, as well as views for generating key reports, this system aims to support restaurant staff in managing daily tasks effectively while ensuring a seamless experience for customers.

This document outlines the design, implementation, and functionality of the E-Restaurant Management System, demonstrating how database management principles can be applied to solve real-world challenges in the restaurant industry.

Project Scope

This section describes what the system includes and what it does not (*Defines the boundaries of the project*).

Example Content:

The E-Restaurant Management System focuses on automating restaurant operations by managing reservations, orders, menu items, and staff attendance.

The scope includes:

- Customer reservations and table management.
- Order processing and menu item availability tracking.
- Staff attendance monitoring and performance reporting.
- Collection of customer feedback for service improvement.

Out of Scope: (What the system does NOT cover)

- Online payment processing.
- External delivery integration.

Mandatory Objectives

This section lists the critical objectives of the system that ensure successful implementation.

Example Content:

The system is designed to fulfill the following mandatory objectives:

1. Admin → Manage the whole system.
2. Customers → Interact with the system to get services.
3. Menu → Contain menu items with categories, pricing, and availability status.
4. Staff → Provide many services for customers.

Software Type & System Functionality

This section describes the software type and how it functions.

Example Content:

The E-Restaurant Management System is a customized, relational database management system (RDBMS) built using SQL Server. It supports:

- Multi-user access with role-based authentication (Admin, Staff, Customer).
- Database-driven operations, ensuring data integrity and consistency.
- Automated processes using stored procedures for handling orders, reservations, and reporting.

Summary of Objects

This section provides a brief summary of the database tables and their roles (*Overview of database tables & entities*).

Summarizing Key Objects (Abstraction):

Shared Entity: (Id, CreateBy, UpdateBy, isActive, UpdateDate, CreationDate)

- A. Admin (Full Name, Email, Password)
- B. Customer (Full Name, Email, Password, Bio, Image, Nationality, Phone)
- C. Menu (Name, Category, Price, Availability, Discounts, Description, Image?)
- D. Staff (Name, Role (e.g., chef, server), Shift Timings, Attendance)
- E. Order (Table Number, Customer Name (optional), Order Date, Status (e.g., pending, completed), Total Amount)
- F. Reservation (Customer Name, Contact Details, Number of Guests, Reservation Date, Table Number)
- G. Contact Details (Phone Number 1, Phone Number 2, Facebook Link, Whatsapp Link)
- H. Feedback (Feedback message, Rate Amount)

Generalization & specialization

This section provides a generalization and specialization step of the database tables (*Restructuring step*).

The generalization appears in:

- Admin , Staff, Customer → Person

➔ The system entities after generalization step is: Person, Menu, Order, Reservation, Contact Details, Feedback + Parent Entity(id, ...)

Lookup table appears in:

- Person Role (Admin, Customer, Staff), City, Nationality, Category → LookupTypes (Id, Name) and LookupItems (Id, Name, TypeId)

Summary of Object Relationships

This section describes how database tables are related and ensures data consistency (*ERD Explanation*).

The system follows a relational database model, where:

- Each Customer (Person) can place multiple Orders and make Reservations.
- Each Order consists of multiple OrderDetails (Menu Items & Quantity).
- Each Staff (Person) has Attendance Records.
- Reservations link Customers to Tables.

Types of relationships:

1. Inheritance:

- A. Combine everything in one table when child mostly the same.
Contains the shared features and features that not in common will be nullable (optional) → Applied on (Person) table.
- B. Create child & add the shared element in each child individually → Applied on each table to add (Parent Entity).

2. Composition:

- Each Customer (Person) can place multiple Orders (1-M).
- Each Customer (Person) can make Reservations (1-M).
- Each Order consists of multiple OrderDetails (Menu Items & Quantity (M-M)).

- Each Staff (Person) has Attendance Records (1-1).
- Each Staff (Person) and each Customer (Person) has one Contact Details (1-1).
- Reservations link Customers to Tables (1-1).
- Feedback link Customers to Reservations (M-M)

Important Notes:

- Feedback considered as Weak entity → Object has strong independency with another entity // or table delivered from relationship (M-M)).
- There`s a multi dependent → 1- Relationship in Feedback (Menu items & Person). 2- Contact Details (Staff & Customer).
- The system followed the normalized approach.