

# Final Project: Project Proposal

PROG2121-25F-Sec1-Relational Databases

Mehakpreet Singh (9022582)

Navjot Singh Bhullar (8981023)

## Contents

TOPIC: FAST FOOD RESTAURANT MANAGEMENT SYSTEM.....	3
INTRODUCTION .....	3
SOLUTION.....	3
KEY USE CASE.....	4
<b>Order Processing and Management</b> .....	4
<b>Menu Item and Category Management</b> .....	4
<b>Inventory and Ingredient Management</b> .....	5
<b>Customer Relationship Management</b> .....	5
<b>Employee Management and Accountability</b> .....	6

# TOPIC: FAST FOOD RESTAURANT MANAGEMENT SYSTEM

## INTRODUCTION

In the rapidly evolving food service industry, operational efficiency and customer satisfaction are paramount to success. Fast food restaurants face unique challenges in managing high-volume transactions, inventory turnover, employee coordination, and maintaining quality standards across multiple locations. A comprehensive Fast Food Restaurant Management System is essential to streamline operations, reduce waste, improve service speed, and maintain profitability in an increasingly competitive market.

## WHY DO WE NEED A RDBMS IN A FAST FOOD RESTAURANTS ?

Fast food restaurants face serious operational challenges when managing their daily business without a proper database system. Tracking customer orders manually leads to confusion during busy hours, resulting in wrong orders being served and unhappy customers. Managing inventory by hand makes it difficult to know what ingredients are running low or which items have expired, causing food waste and situations where popular menu items cannot be made because ingredients are out of stock. Without organized records, staff cannot easily find customer information or order history, making it impossible to build customer loyalty or offer personalized service. Employee scheduling becomes difficult when managers don't have quick access to staff information and availability, often resulting in too many or too few workers during shifts. Financial record-keeping suffers as well, with manual tallying of sales being time-consuming and error-prone, making it hard to track revenue accurately or prepare reports for tax filing and business planning.

## SOLUTION

Fast food restaurants handle large amounts of interconnected data about customers, orders, menu items, ingredients, employees, and suppliers that need to be organized efficiently. Manual record-keeping or spreadsheets cannot properly maintain the relationships between these different types of data, leading to errors, duplicate information, and difficulty in retrieving information quickly. A Relational Database Management System (RDBMS) solves these problems by storing data in organized tables that are connected through relationships, ensuring that when an order is placed, it correctly links to the customer who ordered it, the employee who processed it, the menu items selected, and automatically updates inventory levels for ingredients used. The RDBMS also prevents data inconsistencies by ensuring orders only reference valid menu items and customers, supports multiple users accessing the system simultaneously without conflicts, and enables fast retrieval of any information whether it's finding a customer's order history, checking current ingredient stock levels, or generating monthly sales reports across all locations.

## KEY USE CASE

### Order Processing and Management

Fast food restaurants process hundreds of orders daily that require accurate, fast tracking from placement to completion. During peak hours like lunch rush, when 50+ orders are being processed simultaneously, manual order tracking becomes chaotic, leading to wrong orders, customer complaints, and lost revenue. Staff struggle to remember which orders are pending, which are being prepared, and which are ready for pickup, resulting in customers waiting unnecessarily or receiving incorrect items. Without a systematic approach, there's no way to track order history, identify patterns, or hold employees accountable for processing errors.

A relational database solves these critical challenges through two essential solutions. First, the system records complete order details including date, time, items ordered, quantities, special instructions, and automatically calculates total amounts based on current menu prices, ensuring every order is accurately captured with all necessary information linked to the specific customer and employee who processed it. Second, the database tracks order status in real-time through defined stages (Pending, Preparing, Ready, Completed, Cancelled), allowing kitchen staff to see what needs to be prepared, cashiers to inform customers about wait times, and management to monitor order flow and identify bottlenecks in the process.

### Menu Item and Category Management

Managing a diverse fast food menu with multiple categories, constantly changing prices, seasonal offerings, and varying availability across different times of day presents significant operational challenges. When menu items, prices, or availability need to be updated, doing so manually across multiple ordering systems, printed menus, and digital displays is time-consuming and error-prone, often resulting in customers ordering unavailable items or being charged incorrect prices. Additionally, without organized categorization and detailed item information including descriptions, calorie counts, and allergen data, staff struggle to answer customer questions and customers cannot make informed choices about their meals.

The database addresses these challenges through two key solutions. First, it organizes menu items into logical categories (Burgers, Sides, Drinks, Desserts) while storing comprehensive details for each item including name, description, price, calorie count, and current availability status, ensuring all information is centralized and can be instantly accessed by staff and ordering systems. Second, the system links menu items to their required ingredients, enabling automatic tracking of what can be prepared based on current inventory levels and allowing the system to mark items as unavailable when necessary.

ingredients run out, preventing customer disappointment from ordering items that cannot be fulfilled.

## **Inventory and Ingredient Management**

Tracking hundreds of ingredients across multiple restaurant locations to ensure menu items can be prepared without stockouts or excessive waste is one of the most challenging aspects of fast food operations. Manual inventory checks require staff to physically inspect storage areas, count items, and record quantities on paper, which is time-consuming, inaccurate, and often results in discovering shortages only when customers have already ordered items that cannot be prepared. Without systematic tracking, restaurants either overstock ingredients leading to spoilage and waste when items expire, or understock leading to menu items being unavailable during service, both scenarios directly impacting profitability and customer satisfaction.

The database solves these inventory challenges through two critical solutions. First, it maintains comprehensive ingredient inventory with current stock levels, reorder points, and supplier information for each item, automatically generating alerts when stock falls below minimum levels so management can proactively reorder from suppliers before running out during service hours. Second, the system tracks the exact quantity of each ingredient required for every menu item through recipe definitions, enabling real-time calculation of how many portions of each menu item can be prepared with current inventory and automatically updating stock levels as orders are processed, providing accurate, up-to-the-minute visibility into ingredient availability.

## **Customer Relationship Management**

Building customer loyalty and understanding purchase patterns is essential for fast food restaurant success, yet without a systematic approach to tracking customer information and order history, every customer is treated as anonymous and first-time visitors. This represents a massive missed opportunity because restaurants cannot identify their most valuable frequent customers, cannot offer personalized service or targeted promotions based on preferences, and cannot reward loyalty which research shows significantly increases customer lifetime value and repeat business. Manual customer tracking through punch cards or handwritten logs is inefficient, easily lost, and provides no meaningful data for business analysis or marketing campaigns.

The database transforms customer relationships through two powerful solutions. First, it stores comprehensive customer information including contact details, preferences, and maintains a complete history of every order each customer has placed, enabling staff to recognize returning customers, understand their favorite items, and provide personalized recommendations that enhance the dining experience. Second, the system implements an automated loyalty points program that tracks points earned from purchases and allows customers to redeem rewards, encouraging repeat visits while simultaneously providing

valuable data about customer behavior patterns, purchase frequency, and preferences that inform marketing strategies and menu development decisions.

## **Employee Management and Accountability**

Managing employee information, schedules, roles, and performance across multiple locations with manual systems creates numerous operational inefficiencies and accountability gaps. Without centralized employee data, managers struggle to create effective schedules because they cannot quickly see which employees work at which locations, what positions they hold, or their availability, often resulting in understaffing during peak hours or costly overstaffing during slow periods. Additionally, when customer complaints arise or operational issues occur, there is no systematic way to identify which employee handled specific transactions, making it impossible to provide targeted coaching, recognize top performers, or address recurring problems with specific staff members. The database addresses these employee management challenges through two essential solutions. First, it maintains comprehensive employee records including personal information, position assignments (Cashier, Cook, Manager), hire dates, salary details, and location assignments, providing managers with instant access to complete staff information for scheduling, payroll processing, and operational planning across all restaurant locations. Second, the system links every order to the specific employee who processed it, creating a complete accountability trail that enables management to track individual employee performance metrics such as orders processed, average transaction time, and customer feedback, facilitating objective performance reviews and identifying training needs or recognition opportunities.