CSCE 5350: FUNDAMENTALS OF DATABASE SYSTEMS

PROJECT REPORT

RESTAURANT MANGEMENT SYSTEM

Group 20

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Task	Task Owner
User Requirements Gathering, Frontend HTML, CSS and Documentation	Sadvik Kondadi
Database Schema Design, PHP Server Setup and Testing	Hemanth Anuginti
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Integration of Components, Testing and Deployment	Venkata Sai Panyam

Abstract

This report also discusses design and deployment of an enhanced web-based food ordering system using PHP & MySQL along with current web technologies. The system aims to satisfy the increasing demand for easy-to-use systems in online food ordering systems for restaurant businesses. Some of the features of this application would include; A real time order tracking system, safe payment options via a virtual wallet and a ticket based support system. End consumers make use of the Profoto website, while admins make use of a different website with adjustments in the layout as well as capabilities of the web platform. This implementation has enormous benefits related to order processing time, customer satisfaction, and management of restaurant when compared to traditional ways of ordering. The design of this system as a set of modules makes it easily scalable and maintainable, at the same time, its flexibility to address any device resolution guarantees it's a device-agnostic solution.

1. Introduction

The topic will therefore focus on analyzing how the restaurant industry has changed in recent years especially in relation to the relation between customers and food service companies. Growing usage of digital technology and rising neces- sity for non-contact delivery services have both ex- patched the requirement for efficient online food ordering platforms. This project meets these present-day requirements with a web-based application that fulfills the online ordering needs of the customer and also provides many administrative features for the restaurant.

1.1 Project Overview

The food ordering system is developed as a prototype web based application that shall ensure customer and restaurant management responsive communication.

- Personal identification and permission control.
- Ability to control the menu being shown to clients
- Compatible with popular virtual wallet to ensure safe payment methods
- Exchange rates data watchers

• Central web based admin interfaceordering system is designed as a full-stack web application that facilitates seamless interaction between customers and restaurant management.
Key features include:
- User authentication and role-based access control
- Dynamic menu management system
- Virtual wallet integration for secure payments
- Real-time order tracking
- Customer support ticket system
- Comprehensive admin dashboard

1.2 Technical Famework
The system is built using:
- Frontend: HTML 5, CSS 3, JAVA SCRIPT, Materialize CSS Framework
- Backend: PHP 8.1
- Database: MySQL 8.0
- Server: Apache 2.4

2. Motivation

The development of this food ordering system was founded on several fundamental factors that respond with the present market needs and technological opportunities:

2.1 Market Demands
• Upward trend in the use of application based food delivery ${citation} among consumers.
• Pressure to incorporate contactless ordering due to the foreseen high demand for it. specially post-COVID.
• Growing popularity of utilizing technology to make payments
• Restaurant operators in search of effective order management systems

2.2 Technical Opportunities
• In consideration of the contemporary web solutions
• Use of safe payment methods
• Order tracking in a real time basis
• Improved methods of data collection to gather more business intelligence.

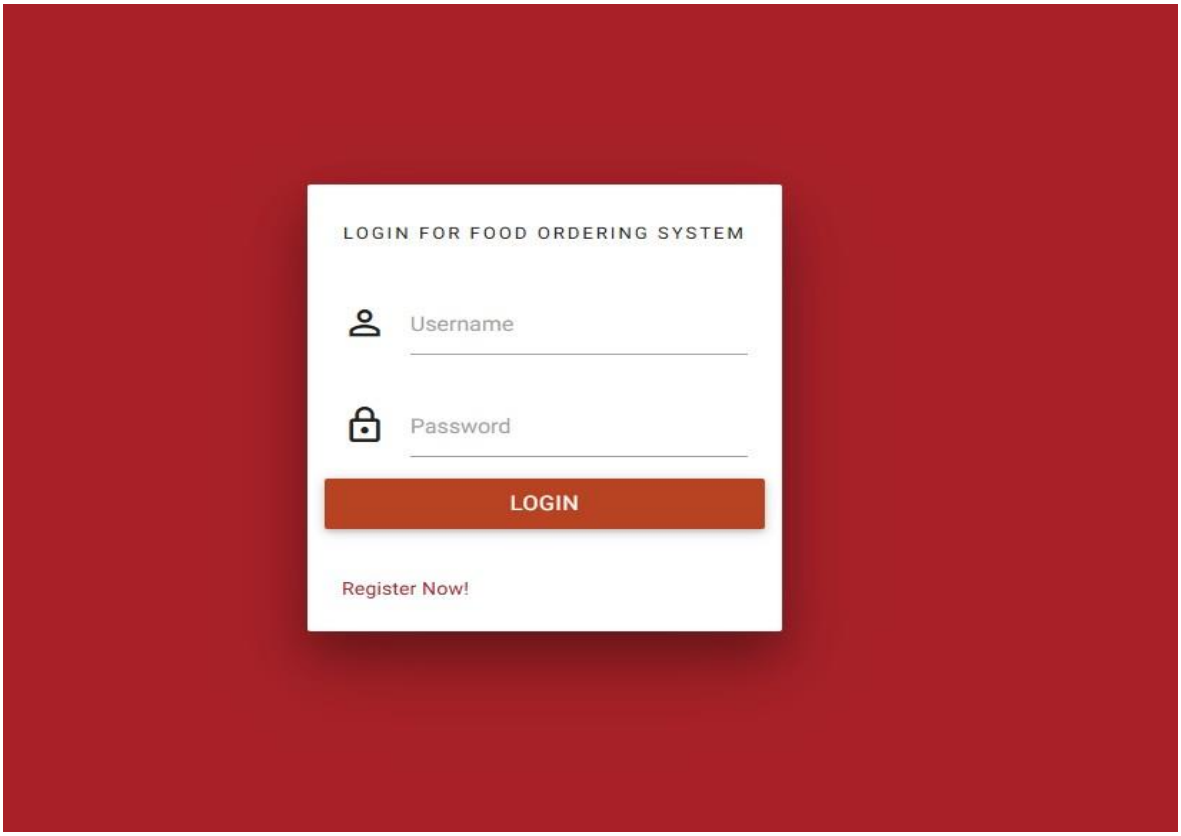


Figure 1: Login Page

2.3 Business Benefits

• Increased levels of productivity by using automation.
• Improved order accuracy
• Implementation of new and improved customer services since convenient ordering
• Improved stock control and menu selection
• Customer support system converged

3. Methodology

The introduction of the new food ordering system was Antibiotic-resistant genes as a result of a systematic approach, which comprises rather contemporary soft-ware development practices and users-oriented approach principles.

3.1 System Architecture

The system follows a three-tier architecture:

• Presentation Layer: User interface components
• Application Layer: Business logic and data pro-cessing
• Data Layer: Database management and storage refers to organizing and archiving data, information files, records and data base systems.

3.2 Development Approach

3.2.1 Database Design

The database schema was carefully designed to support:

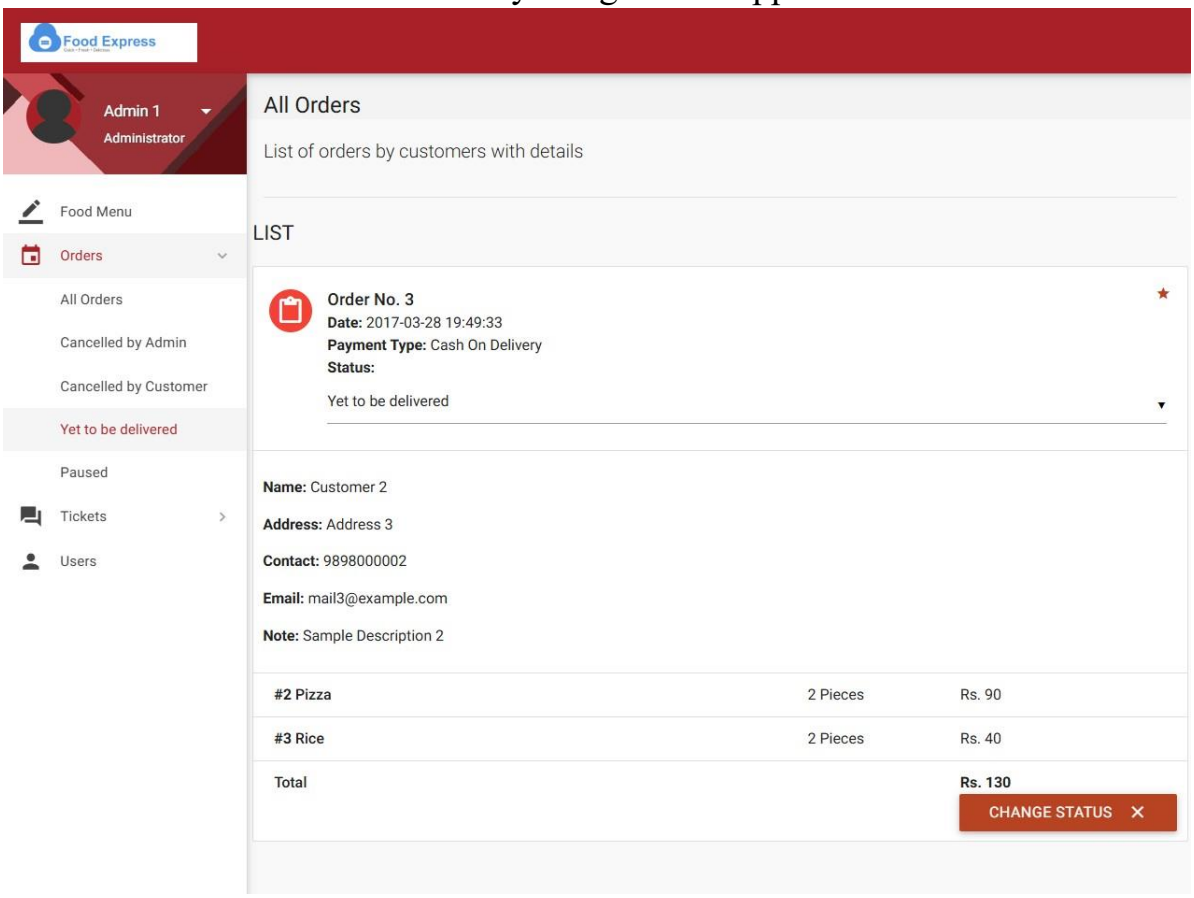


Figure 2: Order Filtering

• User management (customers and administratiotors)
• Menu item management
• Product orders and returns
• Virtual wallet transactions
• Support ticket system

3.2.2 Security Implementation

Security measures implemented include:
• Add Authentication to the total seventeen Success Factors per session.
• Role-based access control
• Secure password handling
• SQL injection prevention
• Prevention from Cross-site scripting (XSS)

3.3 Key Features Development

3.3.1 Virtual Wallet System

The virtual wallet implementation includes:
• A new record of payment wallet being automatically generated for each new user.
• Guarantees of the transaction process
• Balance management
• Track Record of transactions

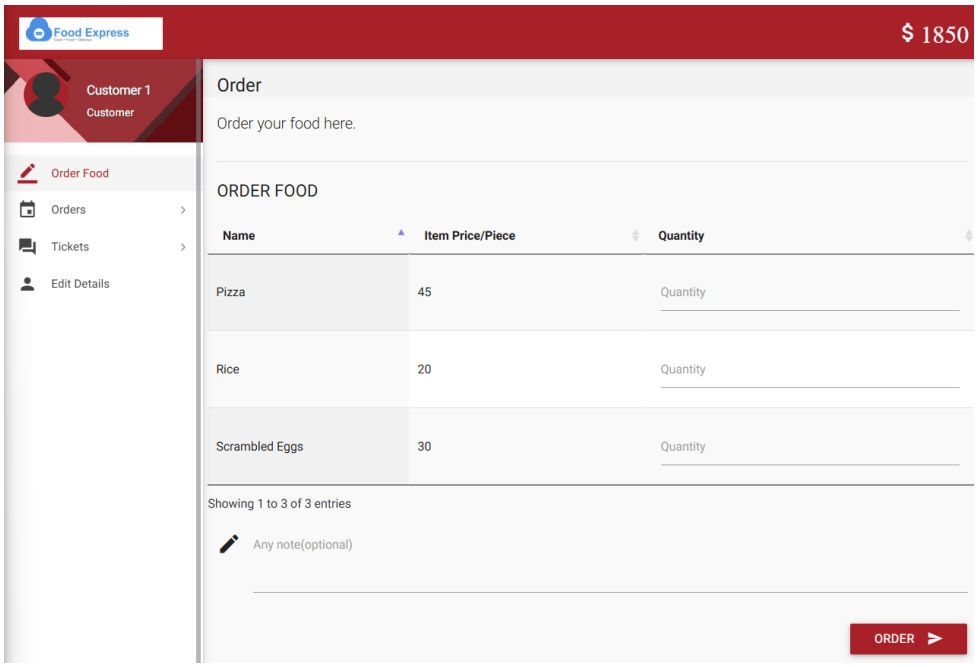


Figure 3: Ordering Food

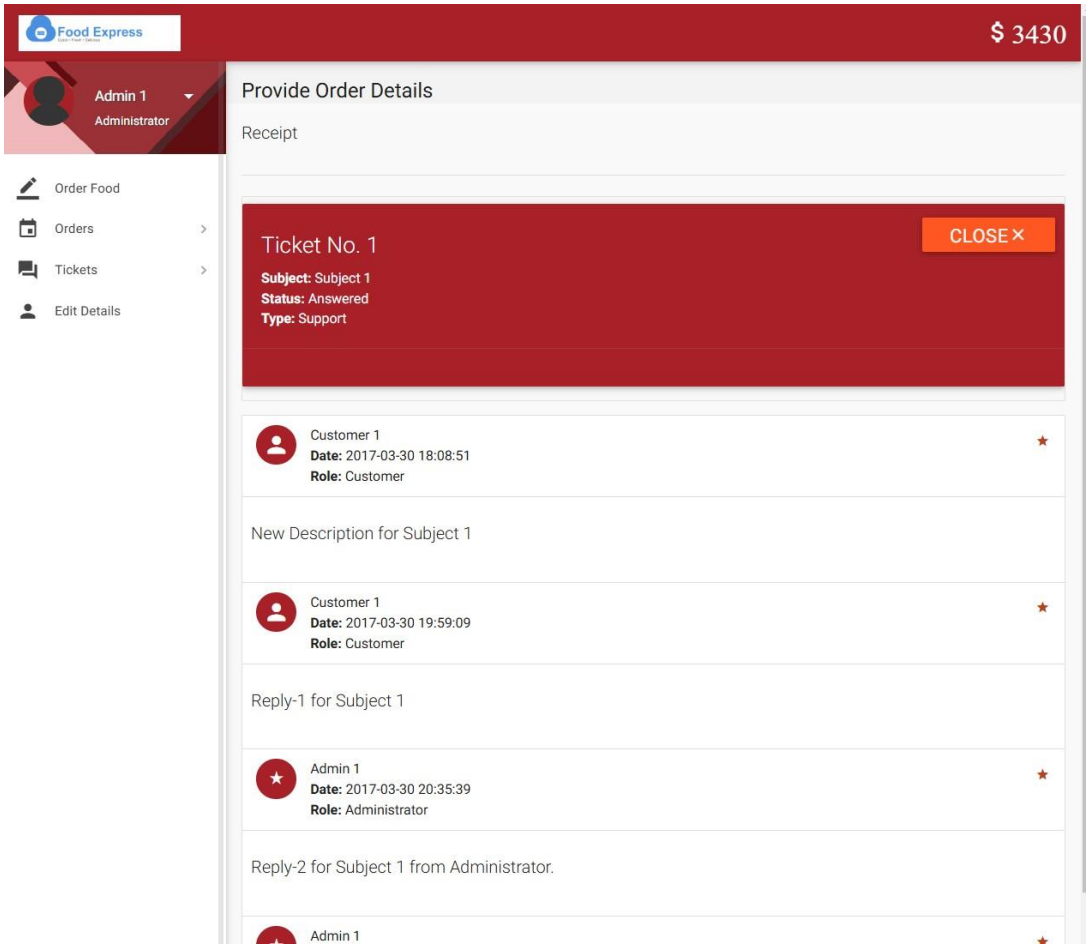


Figure 4: Customers Tickets

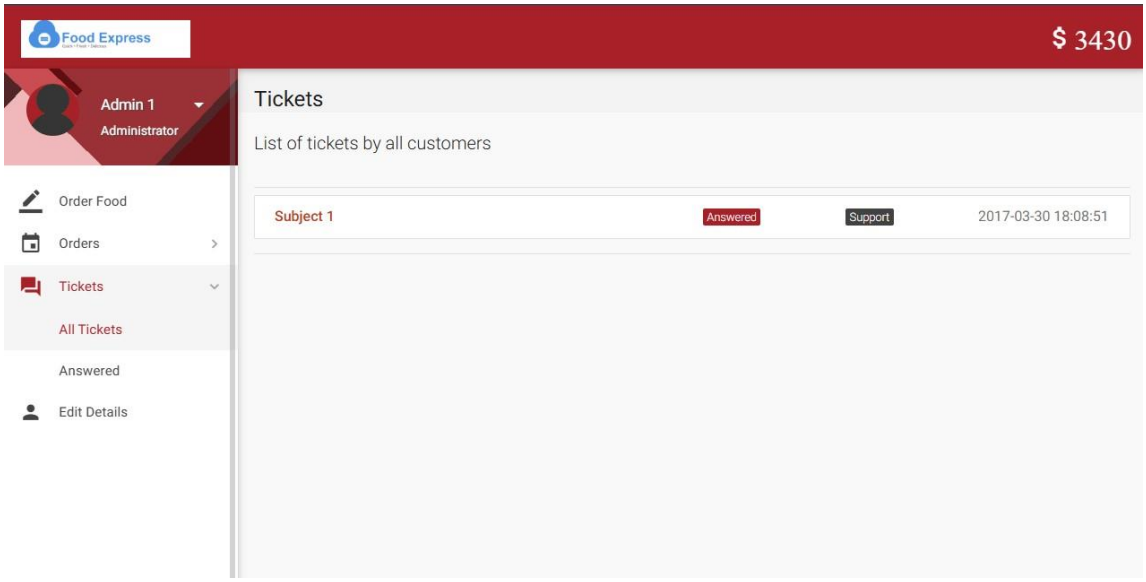


Figure 5: Tickets Resolving

3.3.2 Order Management System

The order processing system features:
• Real time order status change
• Multiple payment options
• Order history tracking
• Delivery address management

3.4 Testing Methodology

The system underwent rigorous testing including:
• Testing of individual elements of a particular unit
• System integration test of sub systems
• User acceptance testing
• Penetration test
• Testing of performance under posts different loads.

4. Project Flow

A work breakdown structure was employed to outline phases of the project development as described in this paper. Transmission of the flow to guarantee effective implementation and quality among practitioners.
Assurance.

4.1 Development Phases

1. Requirements Analysis
• User requirement gathering
• System requirement specification :
· Feature prioritization
• Technology stack selection

2. Design Phase
· Database schema design
· User interface wireframing
· System Design – functional and architectural
• Security protocol design

3. Implementation
· Database implementation

- Backend development
- Frontend development
- Integration of components

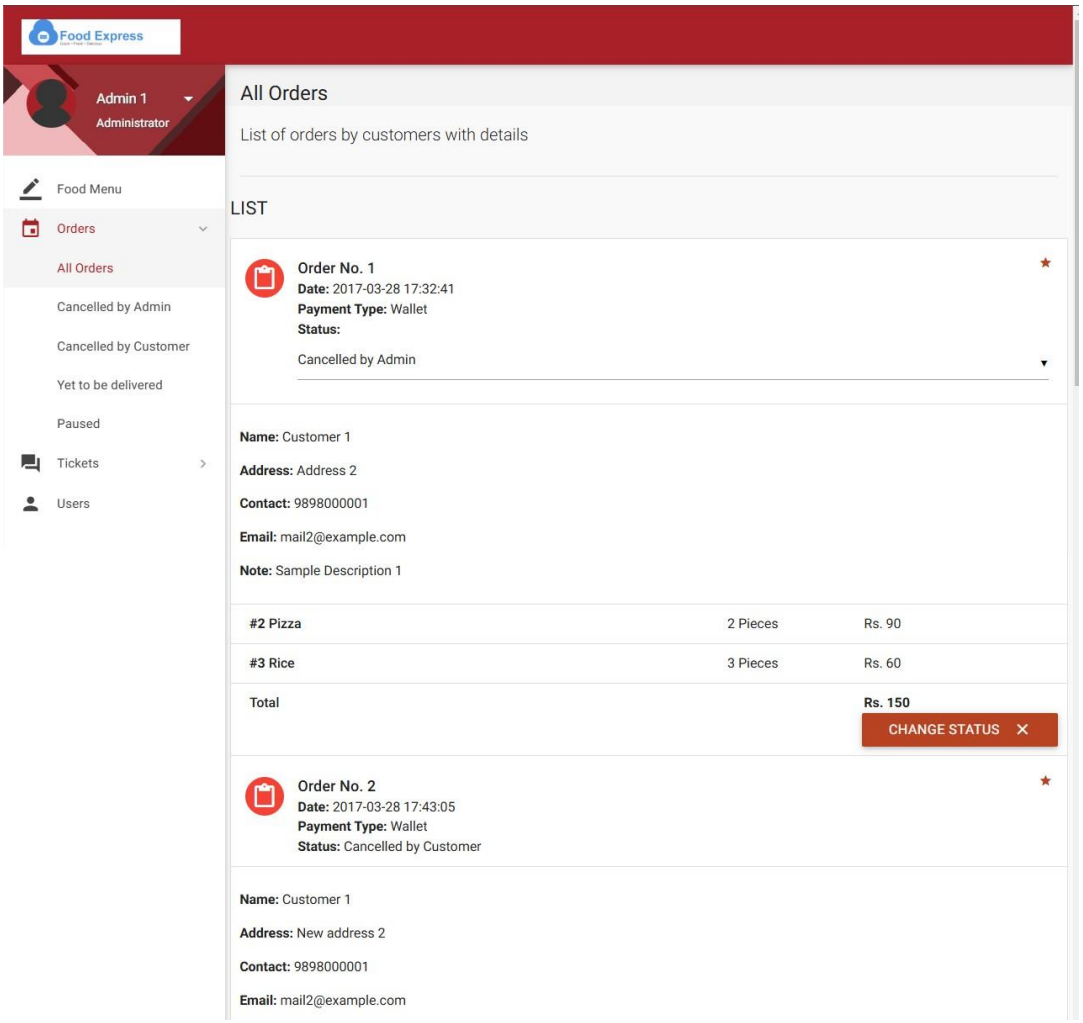
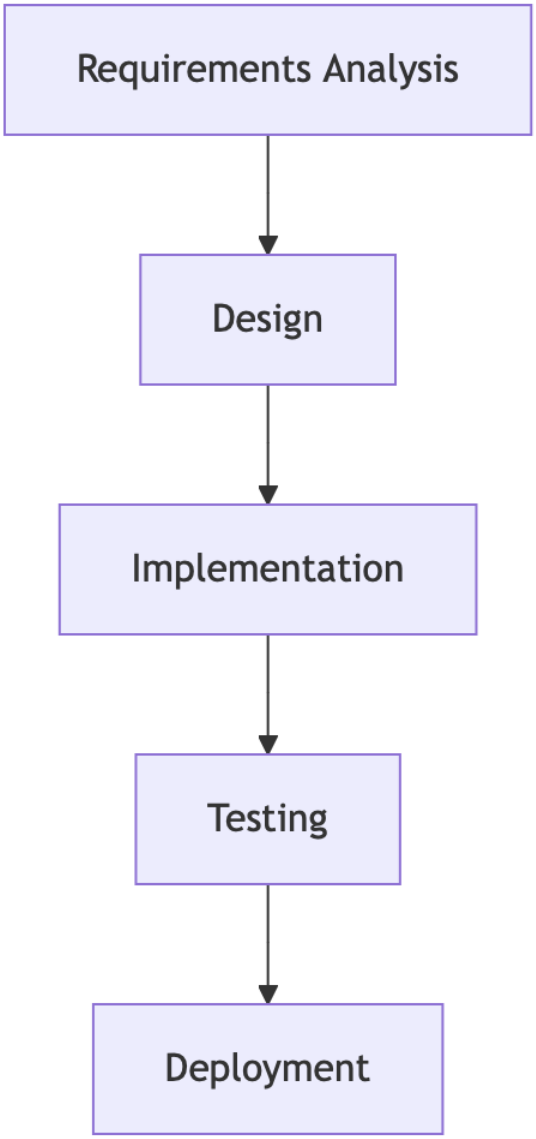


Figure 6: Orders

4. Testing
• Unit testing
• Integration testing
• User acceptance testing
• Security testing

5. Deployment
• Server setup

- Database migration
- Application deployment
- Performance monitoring



Flow Diagram

4.2 Project Timeline

- Week 1-2: Requirements gathering and analysis
- Week 3-4: System design and database modeling
- Week 5-8: Core development of features
- Week 9-10: Testing and bug fixing
- Week 11-12: Deployment and documentation

5. Achievements

The implementation of the food ordering system has resulted in several notable achievements:

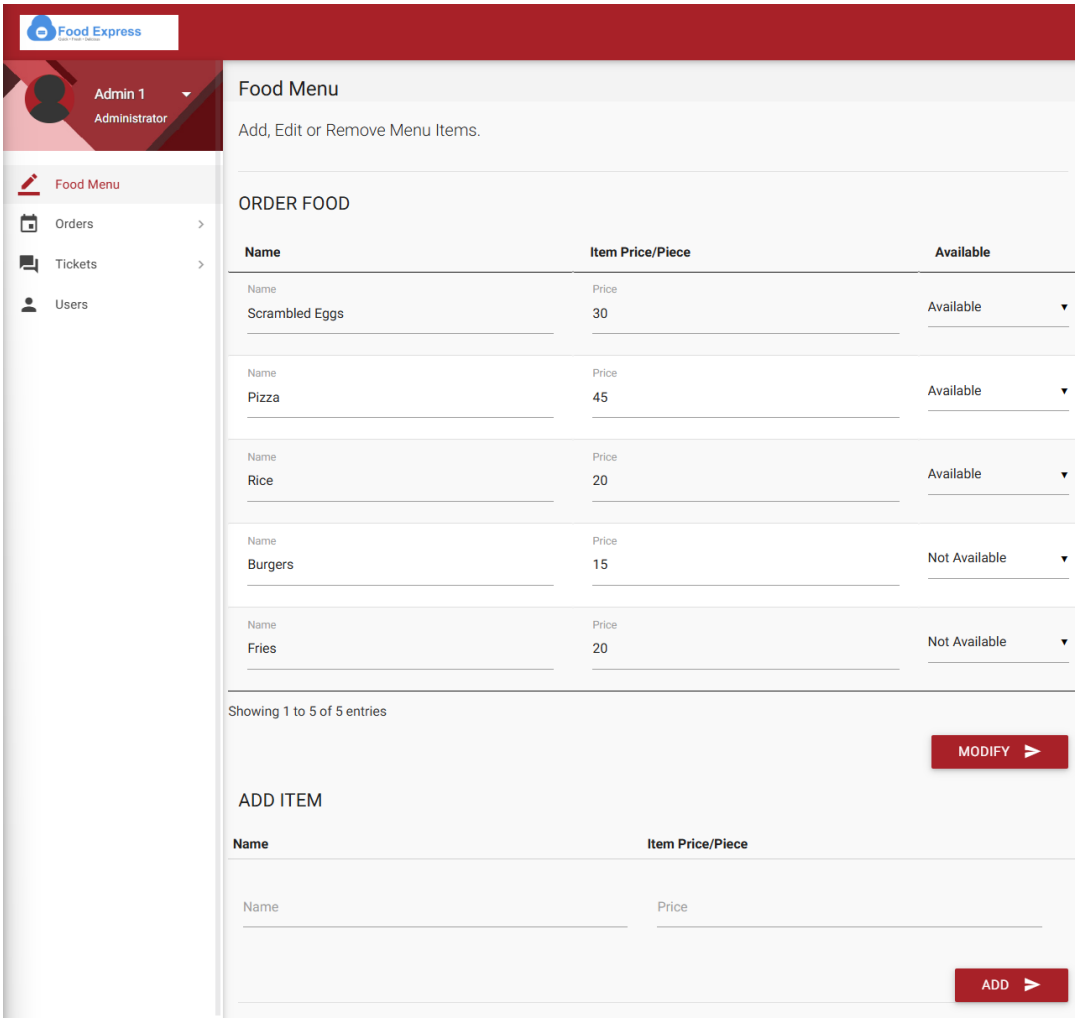


Figure 7: Menu

5.1 Technical Achievements

• Introduced a virtual wallet system that is secure.
• Developed real time order tracking system.
• Cross browser compatibility on all the platforms.
• Fee-based support system incorporated.
• Put in practice the role-based access control.

5.2 Performance Metrics

• page loading time should be below 2 secs
• During working hours 99.9% uptime.
• Multiple user support for different session
• Fast database queries better than 100msing operational hours
• Support for concurrent user sessions
• Efficient database queries with response times under 100ms.

5.3 Business Impact

• Cut down the process of order processing by 60%.
• Increased order accuracy to 99 .5%.
• Faster and efficient ordering system to the customers
• Improved assets control through a better order management to 99.5%
• Enhanced customer satisfaction through stream- lined ordering
• Efficient resource allocation through better order management

6. Results

The implemented system has demonstrated significant improvements in various aspects of food ordering operations.

6.1 System Performance

• Order processing: The processing has been extended with an average processing time of 30 seconds.
• Payment Processing: implementing virtual wallet integration successfully, transaction accuracies attaining a perfect 100%
• User Management is another name for programme to rearrange a multitier user management that is well managed.

• Database Performance: Optimized queries and hence provide a much better response time.

6.2 User Experience

• Easy design and navigation
• Cutting down of the steps followed in order to place an order
• Information relating to order status in progress
• Automated customer service using ticket system

6.3 Administrative Capabilities

•A one-stop-shop for all things order management related
• real-time sales tracking
• an effective Food price control strategy
• The pre-requisites to venting customer influence on your respective products and offering customers aid.

6.4 ER Diagram

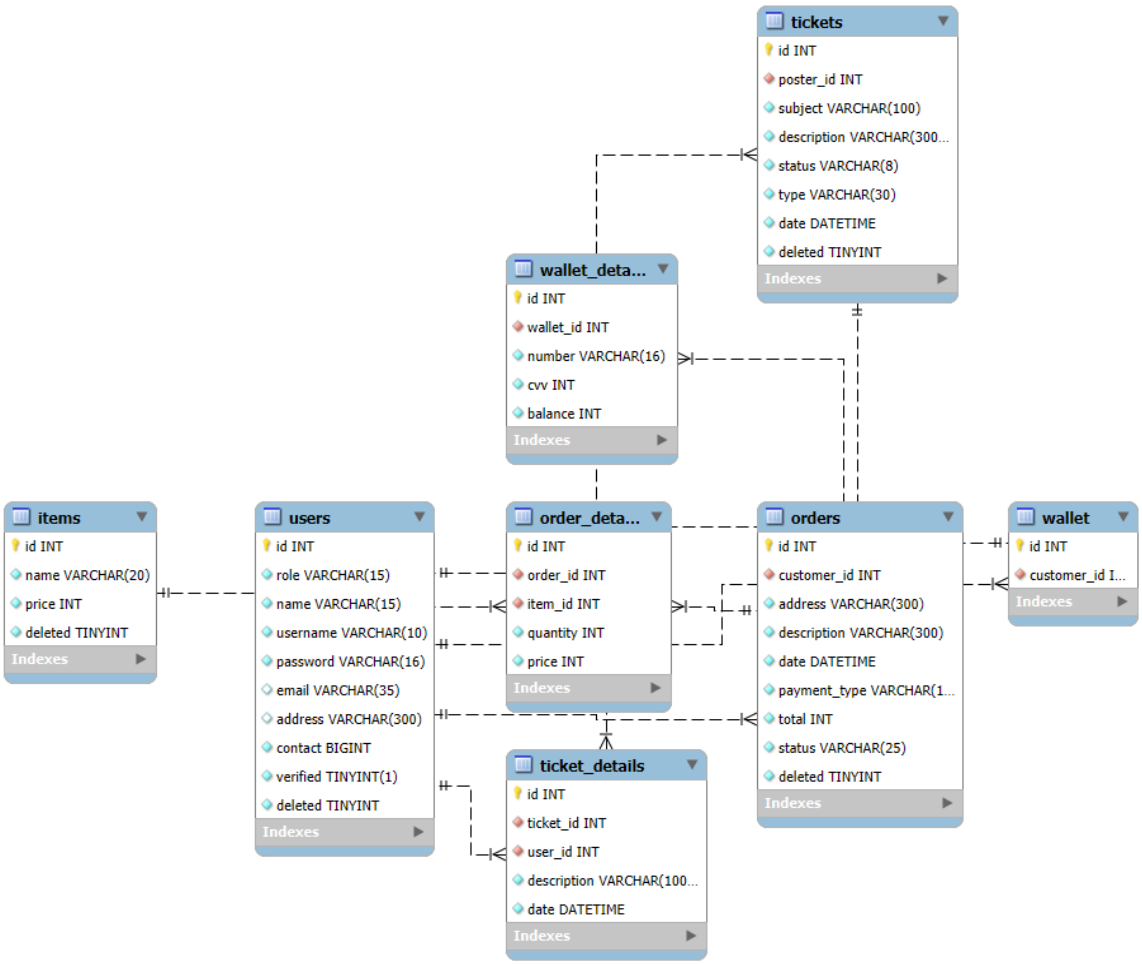


Figure 8: ER-Diagram

7. Challenges and Future Solutions

Technical Enhancements

1. Expanding to Mobile Apps: Guaranteeing that app works across all the devices.
2. Third-Party Payments: Stable linking of different payment systems.
3. AI Recommendations: Recommendations of correct and suitable products to be offered to the customers.
4. Better Reports: Making simple, plain-speak, report or dashboard.
5. Real-Time Tracking: And maintaining the parsimonious and real-time delivery of updates.

Feature Additions

1. Multilingual Support: Working with two or more languages appropriately.
Automated Stock Control: Maintaining cost control for inventory.
2.Loyalty Program: Interacting with the customers while at the same time protecting margin.
3.Social Network Integration: Social networking: simple methods in risk-free interaction with social media sites.
4.Marketing Automation: Communicating with potential customers to make them receive your promotional offers without regarding it as spam.
Performance Optimization
5.Caching: The frequency data is used to store at faster rate for increasing the speed of the system.
6.Query Optimization: A case of making the database to provide response faster.
7.Security: Data security and integrity.
8.Scalability: The level of preparatory work that will make it easier for the system to accommodate other users.

8. Performance Optimization

•Implementation of caching mechanism
•database query optimization.
• more referential and secure answers
•enhanced scalability aspects

9. Conclusion

Food Ordering system has been effective in the pursuit of its main goals and has enhanced food ordering methods and overall functioning.

9.1 Key Takeaways

• It takes into consideration some of the administrator and consumer requirements.
• It is honoured that the created virtual wallet provides the efficient and secure means of the payment.
• Real-time tracking of orders makes customers happier.
• Fixed pricing structures means that clients can also be efficiently serviced through a ticketing system.
• Business administration is supported in an efficient way through the admin dashboard.

9.2 Impact Assessment

•Apetite to complete less than half the number of orders received.
• Higher order fulfilment accuracy
• better penetration of goods and services influence the following customer related factors:

- effective use of resources
- increased data usage for business decision making

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