COURSE PROJECT: PHP PHASE 2:Development of the Minimum Viable Product (MVP)

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Business Case Document

1. Executive Summary

The **Restaurant E-commerce System** is a Laravel-based web application that streamlines online food ordering and restaurant management. It addresses the growing demand for digital ordering experiences by enabling customers to browse menus, place orders, and make payments online. At the same time, it empowers restaurant owners with tools to manage menus, orders, and business profiles, while providing administrators with oversight and control over the platform.

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2. Business Problem / Opportunity

Traditional dine-in restaurants often lack the digital infrastructure to compete with food delivery platforms. Without an online presence, many establishments miss out on revenue, customer engagement, and operational efficiency. The proposed system solves this by:

- Reducing dependency on third-party food apps
- Increasing direct customer engagement
- Streamlining restaurant order and profile management
- Improving operational visibility for admins and owners

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3. Project Objectives

- Provide a fully functional online ordering platform

- Enable restaurant listing and menu customization
- Support secure payment processing and order tracking
- Facilitate effective admin oversight with reporting tools

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4. Scope

In-Scope:

- User roles: Customer, Restaurant Owner, Admin
- Functional modules: Menu Management, Order System, Checkout & Payment, Admin Dashboard, Ratings & Reviews
- Integration: Stripe, PayPal, Razorpay
- Deployment on hosting platforms (AWS, DigitalOcean, etc.)
- Documentation: SRS, User Manual, Installation Guide

Out-of-Scope:

- Native mobile apps (can be considered for future phases)
- Inventory and kitchen-level operations
- Integration with third-party delivery services

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5. Benefits and Value

Benefit	Description
Increased Revenue	Direct online orders increase customer base and reduce third-party fees
Operational Efficiency	Centralized platform simplifies menu and order management
Enhanced Customer Experience	Seamless UI, mobile compatibility, and reviews improve satisfaction

Scalable Architecture	Laravel MVC design allows future feature expansions
Competitive Advantage	Offers smaller restaurants a custom-branded platform

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6. Stakeholders

Stakeholder	Role / Interest
Customers	Place orders, review restaurants, make payments
Restaurant Owners	Manage menus, process orders, view analytics
Administrators	Monitor platform, approve restaurants, generate reports
Development Team	Design, build, test, and deploy the platform

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7. Risk Analysis

Risk	Mitigation Strategy
Payment Gateway Integration Issues	Use well-documented APIs like Stripe & PayPal
Data Privacy & Security	Implement SSL, secure authentication, input validation
Scalability Challenges	Use Laravel’s modular structure and database migrations
Maintenance and Bug Fixing	Include ongoing support and testing frameworks (PHPUnit)

System Architecture

The system follows the MVC (Model-View-Controller) architecture pattern with:

Models

• User (with Admin, Customer)

• Order

• Cart

• Product

Controllers

• AuthController

• AdminController

• CartController

• PaymentController

• MenuController

• ShipmentController

Services

• LoggingService (for centralized logging)

Middleware

• AuthLogging (for authentication event tracking)

• Role-based access control

Technical Implementation

Backend

• Laravel 11.x framework
• PHP 8.x
• MySQL database with Eloquent ORM
• RESTful routing architecture • Blade templating engine Security
• Authentication with Laravel's built-in mechanisms
• CSRF protection for all forms
• Input validation and sanitization
• Database query optimization to prevent SQL injection

Logging and Monitoring

• Custom logging service for all system events
• Multiple log channels for different event types • Environment-specific logging configuration

Testing and Quality Assurance

Automated Testing Implementation
The system includes comprehensive automated tests to ensure functionality, reliability, and maintainability:

Unit Tests

• Model Tests: Verify model relationships and attributes
o UserTest: Tests user roles and dashboard
o CartTest: Tests add to cart option

Feature Tests

• Authentication Tests:

o Login screen rendering

o User authentication with valid credentials

o Authentication failure with invalid credentials

o Registration functionality

Test Results

The test results showed that most of the application's core features are functioning as expected. All unit tests and the majority of feature tests passed successfully, confirming that essential functionalities like authentication, password management, profile updates, registration, and two-factor authentication are working correctly. A few warnings indicate that API token functionality and email verification were not currently enabled, which caused related tests to be skipped. Additionally, one feature test (ExampleTest) failed, suggesting a minor issue that may require attention. Overall, the system was stable with mostly positive test coverage and only a few non-critical configurations pending.

Test-Driven Development

The development process incorporated test-driven methodologies:

• Tests were written to define expected behavior

• Issues were identified through failed tests

• Fixes were implemented and verified through passing tests

• Additional tests were added to prevent regression

Conclusion

In conclusion, the Restaurant E-commerce System represents a robust, scalable, and secure solution that addresses the digital transformation needs of modern dining establishments. By leveraging Laravel's MVC architecture and integrating essential features like secure payment gateways, user role management, and automated testing, the platform ensures seamless user experiences for customers, streamlined operations for restaurant owners, and effective oversight for administrators. The MVP demonstrates strong functionality, reliability, and potential for future enhancements, positioning it as a competitive, cost-effective alternative to third-party food delivery services and paving the way for greater customer engagement and business growth.