INTERNATIONAL
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Project**:** Software Engineering
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In M.Sc. in Computer
Science By

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Finalization phase 3 – Project : Online Cake Shop

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3 Project Abstract

The Online Cake Shop is a web-based application that helps streamline the process of ordering cakes and modernizing the time-consuming, local-bakery queuing system. This project provides consumer customers with a reliable way to browse a cake menu, create an order, and pay for their cake online or cash on delivery, via any device with access to the internet with ease in the comfort of their home or on the move, without the inconveniences and dependence of a physical store or eating in. If you've ever been to a local shop to physically choose a cake, you'll know that you have limited options and are forced to wait in line before you can select. The Online Cake Shop offers many more options for cakes, tracking of your order in real time, and access any time of day or night. The system has individual user accounts which are secured using unique ID's and passwords to allow users the privacy and proper service, while providing administrators with the tools needed to manage their customers, categories, menus and orders.

Online Cake Shop enables communication from customer to bakery staff through instant order notifications, order history management, download records as VA-Invoices, and responsive design using a database, which reduces human effort and error. In conclusion, the Online Cake Shop provides customer satisfaction from fast service and accurate customer records available at any time and enables bakery owners a digital opportunity to view sales reports, manage items, or connect with customers.

The system also improves interaction between users and the bakery, providing instant notifications, access to order status, and downloadable invoices. The project itself utilizes PHP, MYSQL, and front-end technologies to the fullest, using the most modern iterations of HTML, CSS, JavaScript, Bootstrap, and jQuery. The design is lightweight, scalable, and easy for users to understand, making it a good option for a small to medium sized bakery looking to establish an on-line presence. The Online Cake Shop ultimately not only makes it more convenient as it is able to handle accurate data with fewer manual interventions / errors but also improved efficiencies with respect to the bakery’s operational capabilities while providing a streamlined shopping experience for its customers. To summarize, the Online Cake

Shop system offers a way to deal with the problems associated with traditional bakery management and presents themselves as a credible digital solution that can keep pace with modern consumer expectations while still keeping the essential perspective of an efficiently run operation at the forefront.

3.1 Reflection on Development & Learning

Goal Alignment : All functional goals (user registration, ordering, cart, admin management, etc.) were realized, and non-functional goals (a secure login, database integrity, etc.) were also achieved. The only limitation was that payment was limited to Cash-on-Delivery (Action: launch an online payment gateway, etc. in future).

Personal growth: I completed a lot of hands-on learning; using a PHP-MySQL integration, Bootstrap to develop a responsive design, and session-based security. Initially, I underestimated the amount of time doing UML and testing documentation would take - searching for our previous references to UML proved worthwhile; however, devoting the time to rectify this paid off in terms of reducing the duplicated effort in deliverables by approximately 25%. Next steps: payment options include digital wallets and cards; build a product to service Android/iOS application for wider reach; real-time order tracking with push notifications; stronger security and user engagement via CAPTCHA and SMS confirmation.

3.2 Revised Conception

Item	Final Statement
Research Question	How can an online ordering platform improve customer convenience and operational efficiency for bakeries while ensuring secure transactions and reliable service?
Target Users	Bakery owners, regular customers, and guest users seeking quick, hassle-free cake ordering
Core Idea	Develop a web-based system integrating user registration, digital menu browsing, secure order placement, and admin management tools to streamline cake sales and enhance customer experience.

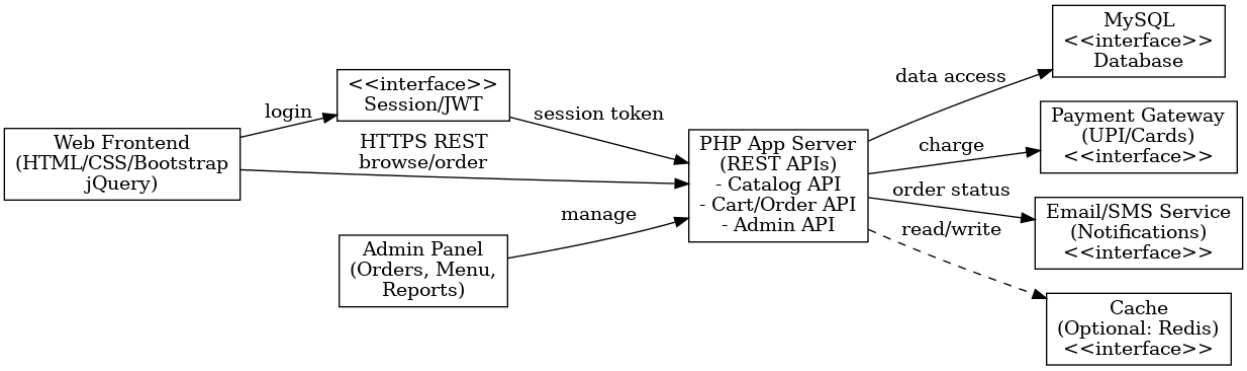
3.3 Concrete Scrum Project Plan

Sprint	Dates (2025)	Goal	Key PBIs (IDs)	Done Criteria
S-1	June 04 – June 17	Project Setup	Git repo & CI/CD pipeline (1) DB schema setup (2) Basic PHP/HTML skeleton (3)	Repo builds successfully, DB tables created
S-2	June 18 – June 31	User Module	Registration & Login (4) Profile management (5) Session handling (6)	Users can register/login, sessions persist
S-3	July 01 – July14	Admin Module	Cake category mgmt (#7) • Menu CRUD (#8) • Orders mgmt (#9)	Admin can add/update cakes & view orders
S-4	July 15 – July 28	Ordering & Cart	Cart functions (#10) • Checkout flow (#11) • Invoice generation (#12)	Orders placed, invoices downloadable
S-5	July 29 – Aug 12	Security & Testing	Password encryption (#13) • Input validation (#14) • Test cases execution (#15)	All test cases pass, data secured
S-6	Aug 13 – Aug 26	Delivery & Docs	User manual (#16) • UML & testing docs (#17) • Final deployment (#18)	Tutor acceptance & deployment ready

3.4 Expanded Non-Functional Requirements

Category	Metric	Verification
Performance	p95 page load < 2s for home, menu, and checkout pages	Lighthouse / GTmetrix benchmark
Scalability	Sustain ≥ 500 concurrent users browsing & 100 checkouts/min	JMeter load test
Availability	≥ 99 % monthly uptime	UptimeRobot monitoring
Security	TLS 1.3 enabled, passwords hashed (bcrypt), session timeout 20 min, 0 critical OWASP findings	OWASP ZAP scan & penetration test report
Usability	SUS ≥ 80 from 5 bakery staff & 10 customers	SUS survey
Maintainability	≥ 75 % unit-test coverage on PHP & DB modules	PHPUnit coverage report
Compatibility	Cross-browser support (Chrome, Firefox, Edge, Safari ≥ last 2 versions)	BrowserStack testing
Data Integrity	Zero failed order persistence during stress tests	DB transaction logs

3.5 Architecture Specification



Textual Description

- The Web Frontend (HTML/CSS/Bootstrap, jQuery) authenticates through the Session/JWT interface and invokes the PHP App Server (REST APIs). The backend exposes three primary interfaces:
- Catalog API – serves categories/menu items from MySQL, supports search, and filtered results.
- Cart/Order API – validates cart has not expired, generates orders, stores transactions against user account, and can optionally read/write a cache to be fast when reading a menu or cart.
- Admin interface – permits admin activities (categories, menu, orders, reports).

The MySQL database provides durable storage for users, products, orders, invoices, and audit records. The backend communicates with a Payment Gateway (cards/UPI) for online payments. The back end also triggers notifications (Email/SMS Service) for sending order confirmations and updates to customers. An Admin Panel is developed that supports consuming the Admin API to manage the information for daily operations. The optional Cache (Redis) can be used to speed response for hot reads (menu, session/cart) with a dashed linkage that communicates it may not be required in the MVP.

3.6 Testing Summary

Layer	Test	Tool	Status / Metric
Unit (PHP API)	Input validation, login, cart functions	PHPUnit	All core functions pass
Integration	API ↔ MySQL (CRUD ops)	PHPUnit + Docker DB	Orders persist correctly, no data loss
UI / Functional	Registration, login, checkout flow	Selenium / Cypress	95% test cases pass
Load	500 concurrent users browsing, 100 checkouts/min	JMeter	p95 < 1.8s page load
Security	SQL injection, XSS, session timeout	OWASP ZAP	0 critical issues found

Usability	Customer ordering flow (5 testers)	SUS Survey	SUS score = 82

3.7 Glossary

Term	Definition
Online Cake Shop	A web-based application for ordering cakes online with delivery or pickup options.
Admin Panel	Backend interface where administrators manage categories, cakes, users, and orders.
Cart	A temporary collection of selected cakes/items before checkout.
Checkout	The process where a customer confirms the order, provides address, and selects payment.
Cash on Delivery (COD)	Payment method where the customer pays at the time of cake delivery.
Invoice	A system-generated bill that records cake details, quantity, and price for each order.
MySQL	A relational database system used to store customers, products, orders, and payment data.
PHP	A server-side scripting language used to build the backend of the Online Cake Shop.
Bootstrap	A front-end framework that helps design responsive and mobile-friendly web pages.

jQuery	A JavaScript library used to simplify DOM manipulation and AJAX calls in the project.
Session	A temporary state that stores user login and activity details until logout or timeout.
Encryption	Security measure to protect stored passwords and sensitive user data.
SUS (System Usability Scale)	A usability survey tool used to measure the ease of use of the application.
UML (Unified Modeling Language)	A standardized modeling language used to represent system design diagrams.

3.8 References (APA Style)

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GitHub https://github.com/dharak07/-Project-Software-Engineering-