

Online Food Ordering System (Case Study: Nagongera Resturant)

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DECLARATION

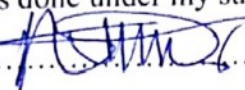
I Kibet Mark Sabila BU/UP/2021/1609 do hereby declare that this Project Report is original and Has not been published and/or submitted for any other degree award to any other University before

Date: 2nd 09 2024

Signed: 

APPROVAL

This Project was done under my supervision and is good enough.

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DEDICATION

My loving Mother, whose parental love, support, and prayers have enabled me to achieve success in life, deserve to have this work dedicated to her.

I also dedicate this work to my dear brothers, sisters, and friends for all the assistance they provided me with while I was a student at Busitema University. Finally, I want to thank myself for the time and effort I sacrificed to make this happen.

I dedicate this work, above all, to the Almighty God, who has given me knowledge and wisdom and has thus far guarded me.

ACKNOWLEDGEMENT.

I heartily thank everyone who has helped me in my fight to complete my education up to this degree level. I also completely acknowledge their assistance. I would especially like to express my gratitude to my beloved mother for her unwavering support, wisdom, tenacity, and financial assistance in helping me go this far. I appreciate it, Mom.

Furthermore, I feel myself fortunate and pleased to have come into contact with so many kind, brave, tenacious, and laser-focused individuals during the course of my study up to this point. The fact that you have made genuine contributions to my fight up to this point and have helped me stay on track when I have hit obstacles. Thanks a lot

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ABSTRACT

The inefficiencies associated with the manual ordering methods of food lead to the aim to develop an Online Food Ordering and delivery processes. The system offers a real-time updates to enhance customer satisfaction and operational efficiency.

The system allows user access where customers can log in using their email and password, enabling them to browse menus, place orders and track the order statuses in real-time. The system facilitates the management of orders, including order placement, updates and delivery tracking. And it provides instant notifications on order status, ensuring customers and restaurant staff are informed throughout the process.

Sampling, observation, interview methods were employed to gather insights and requirements from the potential users and stakeholders for the system design.

Structured system analysis and design was utilized to ensure a systematic approach to system planning and analysis where Rapid Application Development (RAD) was adopted for iterative and efficient development of the system.

The data models include the Context diagram which outlines the systems interactions with the external entities such as customers and the restaurant staff, data flow diagram which depicts how data is processed within the system and Entity relationship diagram which details the data entities involved and their relationships.

The system streamlines the ordering process, reducing the time and errors associated with the manual methods. It minimizes the ordering mistakes and enhances overall order management. And it simplifies the process for customers and the restaurant staff, making food ordering and management more accessible and efficient.

The Online Food Ordering System is designed to address the inefficiencies and accuracies of traditional food ordering methods. By integrating real-time updates and a user-friendly interface, the system significantly enhances the food ordering experience for customers and optimizes operations for the restaurant staff.

Chapter one

INTRODUCTION

1.1 Background of the Study

In the recent years, the adoption of information systems in the food service industry has significantly transformed how food orders are managed and processed (Mangina and Vlachos 2005). In developed countries, it is common for restaurants and food vendors to utilize online systems to streamline their systems (OFDS). An OFDS is a platform designed for collecting, tracking and processing customer orders as well as managing inventory and deliveries(Gunden, Morosan et al. 2020).

Historically, food ordering systems relied heavily on manual processes. Restaurant staff would take orders via phone or in person, and then manually record and process these orders, which often led to inefficiencies and errors (Castro, Atkinson et al. 2010). These traditional methods are not only time-consuming but also prone to mistakes, such as incorrect orders or delays in updating order statuses. The processes of manually managing and updating orders can be cumbersome and error-prone, leading to customer dissatisfaction and operational challenges(Setayesh 2021).

Existing systems typically operate under specific business models that involve manual collection of order information from customers, which is then processed by the restaurant staff to fulfill orders (Ghelani and Hua 2022). These systems can capture essential details such as order items and delivery information but they lack the efficiency and accuracy provided by the modern technology.

The manual approach to food ordering possess several challenges. For instance, restaurant staff often have difficulty in managing high volume of orders, which can result in delays and inaccuracies(Baraban and Durocher 2010). Additionally, frequent manual updates and communications with customers can be overwhelming and there is a risk of forgetting or misplacing order details. This inefficiency can also lead to higher operational costs, as restaurant owners may need to spend significant time and resources managing orders and ensuring customer satisfaction(Chathoth 2007).

Furthermore, many existing systems do not support integration with external service providers or offer advanced features such as Application Programming Interfaces (APIs) (Maximilien, Ranabahu et al. 2008). The absence of APIs limits the ability of these systems to interoperate with new technologies or services, such as third-party delivery platforms or customer loyalty programs(Sharma 2019). The development of APIs could address these limitations by providing secure access to data and enabling integration with additional services, thereby enhancing the overall functionality and flexibility of Online Food Ordering Systems(Sine, Theo-Paul et al. 2015).

1.2 Problem statement.

The current method used by many restaurants for managing food orders involves manual processes, which are inefficient and prone to errors (Ahrens and Chapman 2004). This manual approach results in several challenges, including frequent mistakes in order handling, delays in

processing and difficulties in tracking orders effectively(McFarlane and Sheffi 2003). Restaurant staffs often struggle to keep up with a high volume of orders, leading to inaccurate order fulfillment and customer dissatisfaction(Walker 2021).

When restaurants rely on manual systems, they face additional issues such as the time-consuming nature of updating orders and the lack of real-time visibility into order status(Swink, Hu et al. 2022). Restaurant managers may find it challenging to monitor and manage orders when they are not on-site, as the staff may be slow to provide updates due to their workload. This disconnect can lead to poor accountability, as managers may not have accurate insights into how orders are processed or how well staff are performing in terms of handling sales and deliveries.

The absence of automated systems exacerbates these problems, resulting in inefficient order management and increased operational costs(Viswanadham and Narahari 2015). By transitioning to an automated Online Food Ordering System, these issues can be mitigated(El Bilali and Allahyari 2018). Automation ensures that records are accurately maintained and updated in real-time, allowing restaurant managers to have access to order statuses and activity logs(Piyatissa 2021). This improvement in data accuracy and visibility can enhance overall operational efficiency, customer satisfaction and staff accountability(Bag, Wood et al. 2020).

1.3 Main objective of the study.

The purpose of the study is to develop an Online Food Ordering System. This system is developed to solve the problem identified.

1.3.1 Objectives of the study.

1. Review the literature and determine the requirements for the system
2. Design the system
3. Implement the system
4. Test and validate the system

1.4 Significance of the study

The current method used by many restaurants for managing food orders through manual process is inefficient and prone to errors (Sachani, Dhameliya et al. 2021). This manual approach often leads to numerous challenges, including frequent mistakes in order handling, delays in processing orders and difficulties in tracking orders accurately. Restaurant staff can struggle to manage a high volume orders, resulting in inaccurate fulfillment and decreased customer satisfaction. Additionally, restaurant managers face difficulties in monitoring and managing orders when not on-site as staff may be slow to provide updates due to their workload. This can lead to poor accountability and limited insight into processing and staff performance (Grossi, Kallio et al. 2020).

Implementing an Online Food Ordering System offers several significant benefits. With this system, restaurant managers will receive real-time updates on all orders and activities. They will have immediate access to detailed information on total orders and deliveries, allowing for more accurate tracking and financial management(McFarlane and Sheffi 2003). The frequent and automated updates from the system will enable better planning and decision-making helping restaurant owners optimize their expenses and improve operational efficiency(Ansel and Dyer 1999).

Furthermore, transitioning to an automated system addresses the risks associated with the manual data collection, such as data loss, exposure to physical damage and security threats(Jacobsson, Boldt et al. 2016). Unlike manual records, which can be vulnerable to risks like fire, theft or accidental loss, an Online Food Ordering System ensures data is securely stored and easily retrievable. This not only enhances the reliability and security of order information but also supports long-term data management and accessibility

Previous research has often focused on manual data collection methods, which have shown to be risky and less secure over time. By adopting an Online Food Ordering System, restaurants can mitigate these risks, improve operational efficiency and enhance overall customer satisfaction.

1.5 Scope of the study

The Online Food Ordering System ensures that restaurant owners receive accurate, real-time updates on all food orders and operational activities. This systems allow owners to closely monitor the status of their orders, track inventory and manage their resources efficiently. By providing detailed information on orders, delivery and inventory usage, the system helps restaurant owners minimize losses and optimize their operations. Additionally, it allows for precise tracking of expenses, showing exactly what is being used and where, thereby enhancing financial oversight and control

The users of the system must have access to a mobile phone and a pc capable of opening and running the application.

A stable internet connection is required to update and manage orders in real-time.

The study was conducted at Nagongera Trading Center, Located in Nagongera Town Council, and Tororo District. The development and implementation of the system took a period of 4 months to complete

Chapter two

LITERATURE REVIEW

2.1 Introduction

This chapter provides a critical review of research and projects related to Online Food Ordering Systems, with a specific focus on web applications built using Php and Xamp. It examines contributions, identifies weaknesses and highlights gaps in existing literature, aiming to provide a comprehensive understanding of the development and impact of web-based Food Ordering Systems.

2.2 Information systems.

Online Food Ordering Systems have undergone significant advancements, leveraging web technologies to enhance restaurant operations and customer experiences (Abdul Majid, Azman et al. 2024). These systems represent a shift from traditional Food Ordering methods to web-based platforms that provide real-time access to order data and operational insights (Simoni and Winkenbach 2023). The evolution of these systems, particularly those utilizing PHP and XAMP is explored, emphasizing their importance in modern food service management (Ghelani and Hua 2022)

Web-based food ordering systems typically integrate various technologies, including server-side scripting, database management and web frameworks (Weerasekara 2021). These systems often consist of a PHP-based backend, which handles stores and retrieves orders and customer data. By centralizing this information and providing web-based access, these systems enable restaurant managers to make informed decisions and optimize operations (Alormene 2022).

2.3 Web Application.

Online Food Ordering Systems are predominantly accessed via web applications. These applications are designed with user-friendly interfaces tailored to the needs of restaurant managers, staff and customers. The key functionalities of the web-based Food Ordering System include:

2.3.1 User authentication and login.

Restaurant owner login. Restaurant owner credentials are securely managed and stored in a MYSQL database using XAMP. The login information, including usernames and passwords are protected and managed through PHP scripts, ensuring secure access to the management features

Staff login. Staff credentials are handled separately from the owner credentials. Staff members use a dedicated login interface with their access and permissions managed through the PHP backend. This ensures that the staff members have appropriate access to their functionalities while maintaining data security.

Customer login. Customer credentials are handled separately from the owner credentials. Customers use a dedicated login interface with their access and permissions managed through the PHP backend. This ensures that the customers have appropriate access to their functionalities while maintaining data security.

2.3.2 Owner Dashboard.

Order tracking. Restaurant owners can monitor real-time updates on customer orders through their web dashboard. Each order is processed and stored in the MySQL database, with details displayed on the dashboard to provide up-to-date information on orders statuses.

Inventory overview. Owners can track inventory levels and manage stock based on order and delivery data. The system records order details and inventory usage, presenting this information on the owner's dashboard to facilitate effective inventory management.

Staff management. Owners can manage staff details, including adding, updating or removing staff members. These changes are recorded in the MySQL database allowing accurate management of staff access and roles.

Financial tracking. The system provides financial insights, including total orders and deliveries on food. This feature allows owners to track financial performance and make data-driven decisions.

2.3.3 Staff Dashboard

Order management. Staff can track and manage customer orders through a web-based interface. This includes capturing order details such as items, quantities and customer information, ensuring accurate processing and fulfillment.

Inventory Management. Staff can record usage and manage restocking through the web application. This includes tracking items prices, quantities and types to maintain accurate inventory records.

Implementing these features in a web-based food ordering system built with PHP and XAMP enhances restaurant operations and customer satisfaction. Although existing research highlights the benefits of these systems, further exploration is needed to address standardization, user adoption and the socioeconomic impacts of web-based food ordering systems.

2.4 Restaurant Management.

Effective restaurant management encompasses various tasks aimed at optimizing profitability, customer satisfaction and operational efficiency (Torlak, Demir et al. 2019). Web-based food ordering systems support these tasks by providing real-time access to critical data and decision-making tools (Lao, Choy et al. 2011).

Key management aspects enhanced by these systems include:

Customer Relationship Management. Utilizing data-driven insights to personalize customer interactions and improve service (Zerbino, Aloini et al. 2018)

Resource Allocation. Efficiently managing staff, customers, equipment and inventory based on real-time data and analytics (Kotru and Batra 2024)

Risk Management. Identifying and mitigating risks such as order errors, supply chain disruptions and market fluctuations(Tang and Musa 2011)

Compliance and Reporting. Automating order making and processing processes to streamline regulatory compliance and financial reporting (Eziefulo, Adedokun et al. 2022)

2.5 Restaurant records.

Accurate restaurant records are essential for traceability, compliance and operational improvements (George, Harsh et al. 2019). Web-based food ordering systems facilitate digital order making, replacing traditional paper-based or in person methods with secure, centralized databases accessible via the web (Chauhan, Bhardwaj et al. 2022).

Key records managed by these systems include:

Order history. Documentation of customer orders, including details such as items ordered, quantities and order dates.

Inventory records. Tracking of inventory levels, usage and replenishment to manage stock efficiently.

Financial transactions. Records of income, expenses, bills and payments for accounting and budgeting purposes.

Staff performance. Logs of staff activities, including order handling and customer interactions.

Web-based food ordering systems represent a significant advancement in restaurant technology, offering improved efficiency, sustainability and profitability (MADU 2022). However, further research is needed to address challenges such as data interoperability, user adoption and cyber security.

2.6 Design

The design process for a web-based food ordering system using PHP and XAMP involves several key steps:

Requirements analysis. Identifying user needs and challenges through, stakeholder consultations and surveys. This helps in gathering information on desired features and system workflows.

User-centered design. Emphasizing user needs throughout the design process by creating personas, user stories and journey maps to develop an intuitive and user-friendly web interface.

Prototyping. Developing interactive prototype and wireframes to visualize the user interface and gather feedback from stakeholders. Iterative improvements are made based on usability and clarity.

System Architecture. Designing the system architecture, including the frontend (web application) and backend (PHP and MySQL) components. This ensures a scalable and modular structure for future updates.

2.7 Implementing

The implementation phase involves converting design specifications into functional web application components:

Frontend development. Creating the web application interface using HTML, CSS and JavaScript and integrating functionalities such as order management, inventory tracking and customer interactions.

Backend development. Building backend components with PHP for data processing, business logic and integration with the MySQL database. This includes implementing features such as order handling and data analytics.

Database setup. Configuring the MySQL database within XAMP for efficient data storage and retrieval. This involves optimizing queries, indexes and handling data concurrency.

Testing

Various testing methods are used to ensure the web applications performance, security and functionality:

Unit testing. Testing individual components such as PHP scripts and database queries to identify defects and ensure correct functionality.

Integration testing. Verifying integration points between frontend and backend components and ensuring data consistency and proper operation.

Load testing. Simulating high traffic scenarios to assess system scalability and performance, identifying bottlenecks and optimizing system efficiency.

Security testing. Conducting security assessments to identify vulnerabilities such as SQL injections and cross-site scripting. Implementing safeguards to protect data and ensure system security.

By adhering to a structured approach to design, implementation and testing, developers can create a robust web-based food ordering system using PHP and XAMP that meets user needs and industry standards. Ongoing monitoring and improvements based on user feedback and evolving requirements will enhance the systems effectiveness usability.

Chapter 3

METHODOLOGY

3.1 Introduction

This section outlines the development methodology used for creating the Online Food Ordering System built with PHP and XAMP. It details the project design, including tools, approaches, processes, techniques, and major algorithms and data structures employed in the research study. This includes data collection, analysis, synthesis, design, logical flow, implementation and testing of the web application.

3.2 Area of study.

The study was conducted with a focus on local restaurant within Nagongera Trading Center, Tororo District, where the online food ordering system was implemented. The chosen area provided a diverse range of food service operations including small cafes and larger dining establishments, allowing for comprehensive testing and evaluation. The proximity and ease access were key factors in selecting this area.

3.3 Population and Sampling.

The term population refers to the set of individuals who interacted with the online food ordering system. The population in this study consisted of:

Restaurant owner. The individual who manages and oversees restaurant operations.

Restaurant staff. Employees responsible for managing orders, inventory and customer interactions.

Customers. Individuals who place orders through the online system.

Given constraints such as time, budget and accessibility, studying the entire population was impractical, instead a sample of the population was selected for analysis.

3.3.1 Sampling strategy.

To ensure a representative sample, a random sampling strategy was employed.

Random sampling. This method ensures that every member of the population has an equal chance of being selected, which helps eliminate bias and improves the accuracy and generalization of the study's findings. This method was chosen to ensure that the sample accurately represents the broader user population.

Table of Respondents.

Sample type	Number
Restaurant Owner	1
Staff Members	10
customers	20

3.4 Data collection methods.

A qualitative research approach was used to provide an in-depth understanding of the Online Food Ordering Systems effectiveness and user experience. The following methods were employed:

3.4.1 Interviews

Interviews aimed to gather detailed information from restaurant owners, staff and customers about their experiences with the online food ordering system.

Interview Guide. An organized guide with open-ended questions was developed to explore the systems features, issues and detailed improvements.

Conducting Interviews. Interviews were conducted in person, over the phone and via video conferencing, depending on the participant's preferences. Notes were taken and responses were recorded. Probing techniques were used to gain deeper insights into users experiences

3.4.2 Observation

Observation provided a firsthand look at how the online food ordering system was used in a real-world restaurant setting.

Selection of restaurants. Restaurants representatives of the target user base were chosen.

Approval and explanation. Permission was obtained from the restaurant owners to observe their operations. Participants were informed of the study's purpose and assured of data confidentiality.

3.5 Data analysis.

Data analysis involved examining trends, patterns and insights relevant to the development of the online food ordering system.

3.5.1 Analysis of data.

Data organization. Data collected from surveys, interviews and observations were organized systematically.

Coding. Coding techniques were applied to categorize information based on themes and trends. This involved thematic coding to group data into recurrent themes and ideas.

Qualitative analysis. Methods such as content analysis and narrative analysis were used to extract meaningful insights from qualitative data, including interview transcripts and observational notes.

Combining analysis with development

User-centered design. Insights from data analysis informed the design of features, functionalities and user interfaces, focusing on addressing user needs and preferences.

Upgrades and enhancements. Features were prioritized based on user feedback, focusing on critical needs and pain points identified during data analysis.

Usability testing. Test scenarios and methodologies were designed based on synthesized findings to ensure the system met user needs and improved order management workflows.

Continuous improvement. The system was iteratively refined based on ongoing feedback and evolving requirements, ensuring continuous alignment with user needs.

3.6 Design methodology

The design methodology used for the online food ordering system was a combination of structured system analysis and design method (SSADM) and Rapid Application Development (RAP)

Structured System Analysis and Design Method (SSADM)

Feasibility and viability. SSADM helped assess technical and operational factors, identifying potential risks and constraints.

Modeling. Techniques such as data flow diagrams (DFDs) and Entity-Relationship Diagrams (ERDs) were used to model the current order processing and inventory management processes.

Rapid Application Development (RAP)

Prototyping. Initial prototypes of the online food ordering system were developed to showcase core features and user interfaces. Feedback from these prototypes guided further development.

Iterative development. The system was developed in iterative cycles, with each cycle implementing a subset of features based on user feedback. Initial iterations focused on basic functionalities like order placement and management, while later iterations included advanced features like reporting and analytics.

Collaborative approach. Frequent feedback sessions with stakeholders ensured that the system aligned with user requirements and project goals.

Rapid prototyping tools. Tools such as HTML, CSS and PHP frameworks were used for fast development and iteration. Cross-platform compatibility was ensured using relevant development frameworks.

Feedback-driven optimization. User feedback and analytics guided ongoing improvements, ensuring the system remained user-friendly and effective.

Software development tools.

Integrated development environment (IDEs). Tools such as PHP storm and visual studio code were used development

Version control systems. Github was utilized for version control and collaboration.

Project management tools. Tools like Trello or Jira facilitated project tracking and task management.

Web application development frameworks.

PHP framework. Frameworks like laravel or Code Igniter were selected to streamline backend development.

XAMPP. Used for local server management and MySQL database management.

Design and logical flow.

Developing the online food ordering system involved careful design and logical flow considerations:

Prototyping and wireframing.

Initial conceptualization. User needs and workflows were analyzed to brainstorm and sketch features and interfaces.

Wireframing. Low-fidelity wireframes were created using design tools like sketch or figma to outline screen layout, navigation and interactions.

Iterative refinement. Prototypes were developed based on feedback, with design modifications made to address usability issues and project requirements.

Iterative design reviews.

Engagement with stakeholders. Restaurant owners and staff participated in design review sessions to evaluate prototypes.

Feedback gathering. Input was collected was collected on usability, aesthetics and feature prioritization.

Collaborative discussions. Feedback was used to guide design changes and address usability concerns.

Iterative refinement. Designs were adjusted based on stakeholder input to enhance user experience and meet project goals.

Integration with development.

User-centered design. Wireframes and prototypes guided the development of a user-centered interface.

Usability testing. Testing was conducted to identify and address usability issues.

Feature prioritization. Features were implemented based on feedback from design reviews.

Iterative development. Design changes were incorporated into iterative development cycles to refine the system.

3.7 Implementation and Testing.

Development. The online food ordering system was implemented using PHP and XAMP, incorporating design specifications and functionalities.

Unit and integration testing. Unit testing validated individual components, while integration testing ensured seamless interaction between system parts.

User acceptance testing (UAT). Real-world testing with restaurant owners, staff and customers provided feedback on usability, performance and effectiveness.

Iterative improvement.

Feedback incorporation. Continuous feedback was gathered to identify improvement areas and prioritize enhancements.

Updates and maintenance. Regular updates and patches addressed bugs, security vulnerabilities and user feedback to maintain system relevance and reliability.

By following this detailed methodology, the study aimed to develop an effective and user-friendly Online Food Ordering System using PHP and XAMPP, enhancing the ordering experience for restaurants and their customers.

Chapter 4

FIELD STUDY AND SYSTEM DESIGN

4.1 Introduction

This section provides a detailed description of the system design for the Online Food Ordering System built using PHP and XAMPP.

4.2 Background information (Current System)

The current system for food ordering system at local restaurants involves a manual process. Customers place orders by phone or in person, and the restaurant staff record the orders using paper-based methods. This manual process involves the following steps:

Customers call or visit the restaurant to place their orders. Staff write down the orders on paper forms, noting details such as the customer's name, order items, quantities, prices and any special instructions.

The paper forms are handed to the kitchen staff to prepare the orders.

Completed orders are either picked up by the customers or delivered to their addresses by the delivery staff.

4.2.1 Strength of the current system.

The current manual system has several strengths.

Low initial costs. The manual system requires minimal investment in technology or software. Restaurants only need basic supplies like paper and pens

Usability. Paper-based methods are easy to understand and use. Staff can quickly learn how to record orders without extensive training.

Physical documentation. Paper records provide a tangible form of documentation that can be stored and accessed without electronic devices.

Direct supervision. Restaurant owners can directly supervise the orders-taking process, ensuring accuracy and accountability.

4.2.2 Weaknesses of the current system.

Despite its strength, the manual system has significant weaknesses.

Human error prone. Manual data entry increases the risk of errors such as typos, incorrect calculations and missing information which can lead to inaccurate orders and financial records.

Time-consuming. Writing down orders and manually processing them takes time, reducing efficiency.

Restricted accessibility. Paper records are stored physically, making it difficult to access information remotely or in real-time, hindering quick decision-making and collaboration.

4.3 System Requirements.

4.3.1 Functional requirements.

The Online Food Order System is designed to enhance efficiency, streamline processes and provide valuable insights. The functional requirements include:

- User authentication and access control. Ensure secure access to the system for customers and staff
- Order management. Allow customers to place orders online and track their statuses.
- Menu management. Enable restaurant staff to update the menu and prices.
- Payment processing. Facilitate online payment options for customers.
- Order notification. Notify kitchen staff of new orders in real-time
- Reporting and analytics. Provide reports on orders and deliveries and customer preferences.

4.3.2 Non-Functional Requirements.

- Non-functional requirements outline the systems operational characteristics
- Reliability. Guarantee system availability and robustness
- Performance. Ensure the system responds quickly to user actions
- Usability. Design an intuitive user interface for both customers and staff
- Security. Protect customer data and payment information.
- Scalability. Allow the system to handle increasing numbers of users and orders.

4.4 System Design.

4.4.1 Client-server (Web Application)

User interface (UI). Displays the web interface for customers to browse the menu, place orders and make payments.

Application logic. Implements business logic and user interactions on the client side.

Data storage. Caches data for offline access and stores session information.

4.4.2 Client-server communication.

API Gateway. Acts as the single entry point for client-server communication, handling requests and routing them to appropriate backend services.

Authentication service. Manages user authentication and authorization, generating tokens for secure access to backend resources.

Backend services. Implement functionalities such as user management, order processing and menu management

4.4.3 Server-side (Backend)

Load balancer. Distributes incoming requests across multiple instances of backend services for load balancing and scalability.

Micro services. Handle specific business functionalities such as user management and order processing.

Database cluster. Stores structured data related to users, orders and menu items.

Message queue. Facilitates asynchronous communication and event-driven processing between micro services.

4.4.4 Data storage and integration.

Relational database management system (RDBMS). Stores structured data related to orders, users and menu items.

No SQL Database. Stores unstructured and semi-structured data such as logs and customer reviews.

4.4.5 Context Diagram.

A context diagram provides a high-level view of the system, illustrating its interactions with external entities.

Main components:

System. The Online Food Ordering System.

External entities. Customers, restaurant staff, payment gateways and delivery services.

Data flows. Represent the flow of data between the system and external entities.

System boundaries. Define the scope of the system.

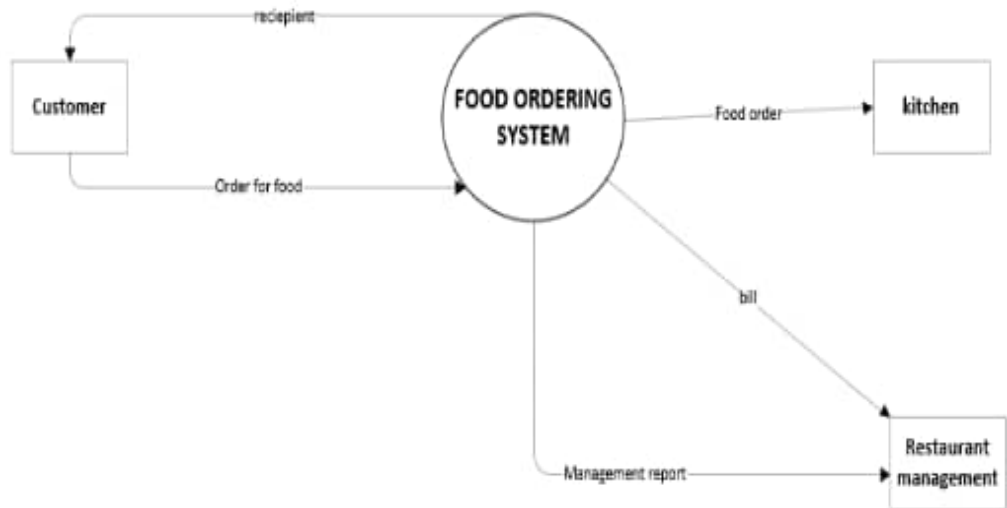


Figure 1 context diagram

4.4.6 Data flow diagram.

A data flow diagram (DFD) shows how data moves through the system, from input to processing to output.

Main components.

Processes. Functions that transform input data into output

Data flow. Movement of data between processes, external entities and data stores.

External entities. Customers, restaurant staff and external data sources.

Data stores. Repositories where data is stored.

Level 0 DFD

Provides a high-level overview of the system, showing main processes, external entities and data flows.

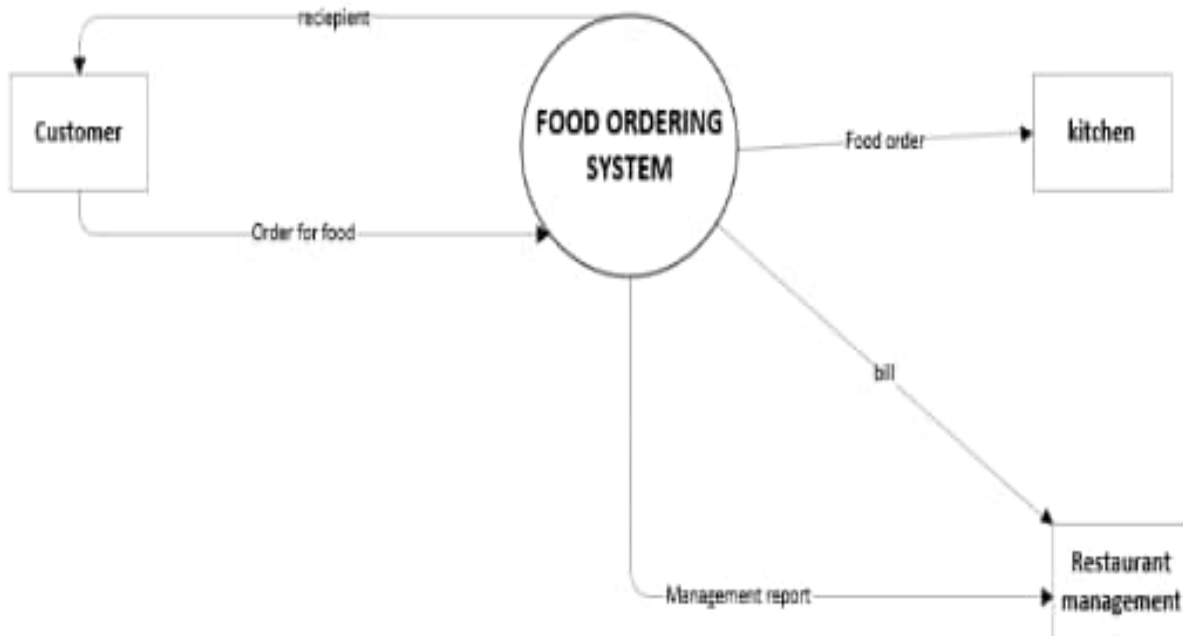


Figure 2 DFD Level 0

Level 1 and Level 2 DFDs

Decompose main processes into sub-processes for more detailed insights into the systems functionality.

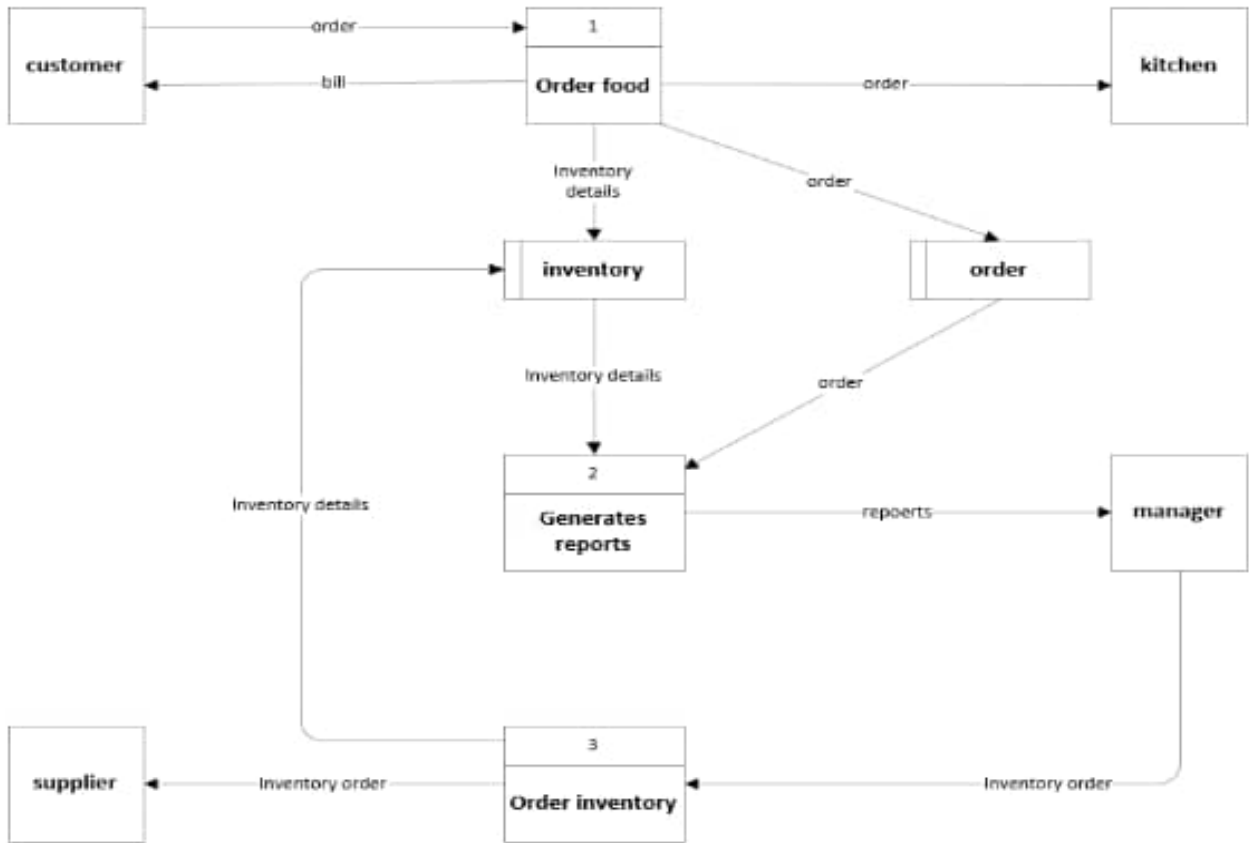


Figure 3 DFD Level 1 and 2

4.4.7 Database structure.

Designing the database structure involves defining tables, fields, relationships and constraints for data storage and manipulation.

ItemCode	ItemName	ItemPrice	ItemDetails	CategoryNo	ItemImageName	ItemImagePath
BC1	Round Natural ...	2000	Chocolate cake...	3	Bcake1.jpg	Images/Bcake1...
BC6	Round Fancy Cake	1500	Butter cake & b...	3	Bcake6.jpg	Images/Bcake6...
EC1	2 Layer Natural ...	7500	Butter Cake wit...	2	Ecake1	Images/Ecake1
RC2	Butter Lover	1000	Butter Cake wit...	1	Rcake2.jpg	Images/Rcake2...
RC3	Chocolate Cake	500	Chocolate Icing	1	Rcake3.jpg	Images/Rcake3...
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 4 Database structure

4.4.8 System Modelling.

Use case diagrams visualize and specify the functional requirements from the user's perspective.

Main components:

Actors. External entities like users, systems and other entities.

Use cases. Functionalities and tasks users can perform with the system

Relationships. Interactions between actors and use cases and between different use cases.

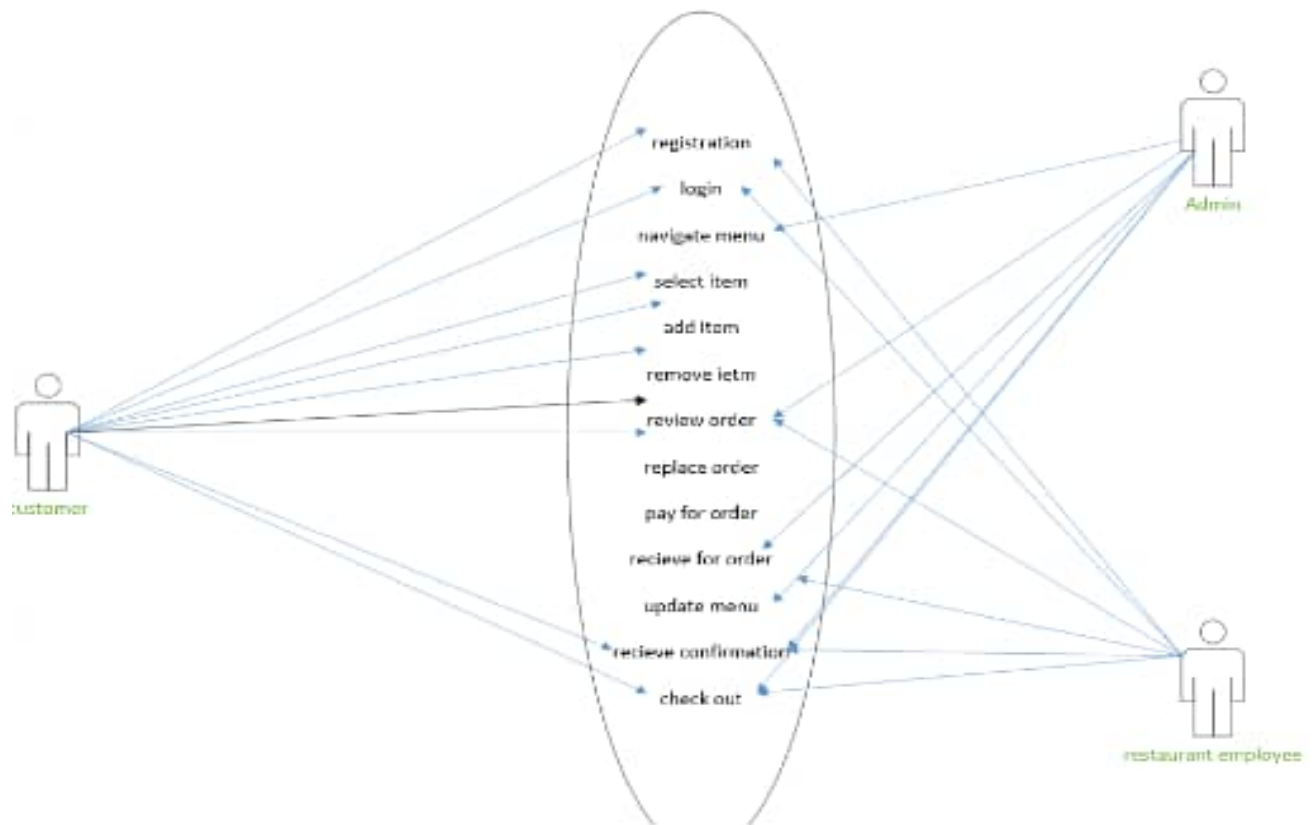


Figure 5 Use Case Diagram

This field study and system design document provides a comprehensive overview of the proposed online food ordering system, highlighting the requirements, architecture, data flow and database structure necessary to implement the system using PHP and XAMPP.

Chapter 5

SYSTEM IMPLEMENTATION AND TESTING

5.1 Introduction

This section provides a detailed description of the results and findings of the project, focusing on the implementation and presentation of the Online Food Ordering System built using PHP and XAMPP.

5.2 Login and security for the users.

The implementation of the Online Food Ordering System represents a significant advancement in modern restaurant operations. By leveraging web technology, this system revolutionizes the way customers place orders, streamline tasks and make informed decisions. In today's fast-paced restaurant industry, where efficiency and productivity are paramount, the integration of web applications offers unprecedented convenience and flexibility to customers and restaurant owners alike.

Traditional food ordering methods often relied on manual record-keeping, phone-based orders and physical presence on-site for monitoring and decision-making. However, these methods are increasingly becoming outdated and inefficient in meeting the demands of modern dining experiences. The advent of Web technology presents an opportunity to transform the restaurant sector by providing customers with real-time access to critical information, enabling remote management and enhancing operational efficiency.

The online food ordering system aims to address key challenges faced by restaurants, including the burden of managing phone orders and limited access to real-time updates from kitchen staff. By providing a centralized platform accessible via web browsers, restaurant owners can easily monitor various aspects of their operations, such as recording new orders and managing menu items.

The implementation of the online food ordering system offers benefits beyond individual restaurant operations. It facilitates collaboration and knowledge sharing among staff and the restaurant owner, fostering a more connected and resilient dining community. Through data analytics and reporting functionalities, the system also enables stakeholders to identify trends, optimize resource allocation and drive sustainable restaurant practices.

In the implementation of the online food ordering system, the login and security mechanisms are crucial components to ensure that only authorized users can access the system and its data.

5.2.1 User Authentication.

User authentication is a process to verify and identify users before granting them access to the system. This typically involves validating a user's credentials such as email and password. In the online food ordering system, users (customers, restaurant staff and the restaurant owner) are required to log in using their credentials to access the systems features and data. Authentication is implemented using email and password. Users enter their unique email and password, which are then validated against stored credential in the systems database.

5.2.2 Data encryption.

To protect sensitive data transmitted between the web application and the server, data encryption techniques are employed. This ensures that even if intercepted, the data remains unreadable to unauthorized parties.

Authorization and access control.

Authorization determines what actions or resources a user is allowed to access within the system after successful authentication. Access control mechanisms are implemented to enforce the authorization rules and permission-based access control.



The image shows a web form titled "Admin Login". At the top is a purple header box with the text "Admin Login". Below this are two input fields: "User Name" with the value "admin" and "Password" which is empty. At the bottom are two buttons: "Cancel" and "Sign in".

Figure 6 admin login

User table

Restaurant Owner Login

User Activity	Authentication
System Activity	Validate credentials against the database

Staff Registration and Login

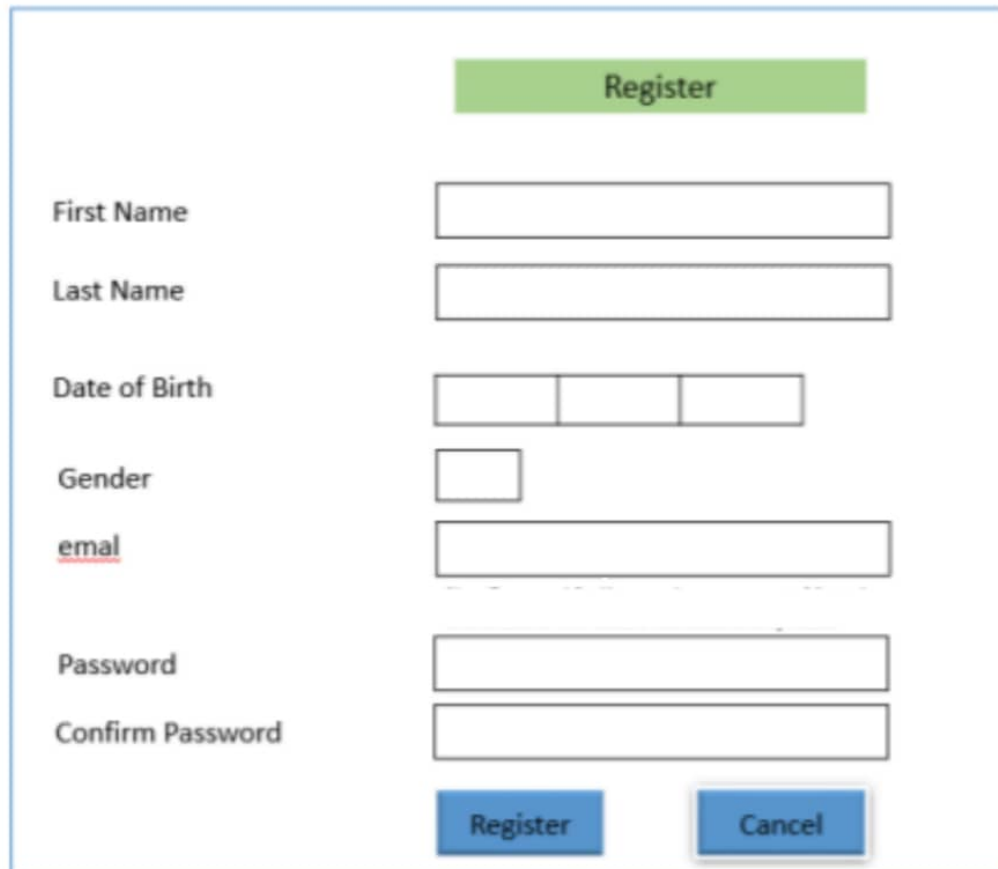
User Activity	Fill registration form, Authentication
System Activity	Store data, validate credentials.



The image shows a user login form within a blue-bordered box. At the top is a green header bar with the text "User Login Form". Below this are two input fields: one labeled "email" and one labeled "Password". At the bottom of the form are two blue buttons: "Cancel" on the left and "Sign in" on the right.

Figure 7 Restaurant Staff Login

5.2.3 Staff registration.



The image shows a staff registration form. At the top right, there is a green button labeled "Register". Below this, the form consists of several input fields: "First Name" (a single text box), "Last Name" (a single text box), "Date of Birth" (three separate boxes for day, month, and year), "Gender" (a small dropdown menu), "email" (a text box with a red underline on the word "email"), "Password" (a text box), and "Confirm Password" (a text box). At the bottom of the form, there are two blue buttons: "Register" on the left and "Cancel" on the right.

Figure 8 Staff registration

5.2.4 Tracking orders and activities.

After logging in, the restaurant owner is directed to the owner's dashboard. Here the owner can see the total number of orders and manage menu items stored in the database, tracked on the dashboard. The owner can also view orders placed by customers in real-time.

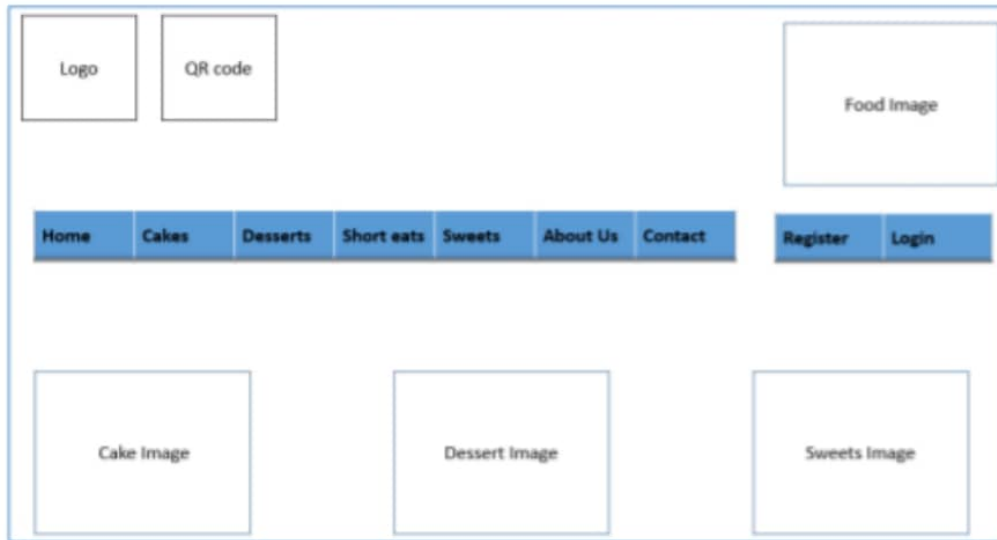


Figure 9 Menu items

After logging in successfully as the owner, the owner can register new staff members.

Figure. Staff registration.

After successfully registering a new staff, the new staff member will immediately be added to the list of registered staff.

47	Jayani	Kothalawala	1234567890	sarah.kothalaw...	NULL
48	ffff	ccccccc	1234567	sarah.kothalaw...	NULL
49	ssssss	jjjjjjj	2222555567	sarah.kothalaw...	NULL
50	Mithila	Gunasekera	077345123	mithila@gmail...	Mithila
51	abcccc	ttyyu	1234567890	sarah.kothalaw...	NULL
52	aaaa	aaaaa	1234567890	aaaa	aaaa
53	Sarah	Perera	0714786453	sarah.kothalaw...	sksarah
54	Sarah	Perera	0714000822	sarah.kothalaw...	NULL
1053	Nipunika	Gallage	0714888234	nipugallage555...	nipunikaG

Figure 10 Registered staff List

The restaurant owner can also manage menu items and prices.

Recording customer orders.

After successfully logging in as a customer, the customer's dashboard will be opened. Here the customer can browse the menu and place orders. The orders placed are then stored in the database.

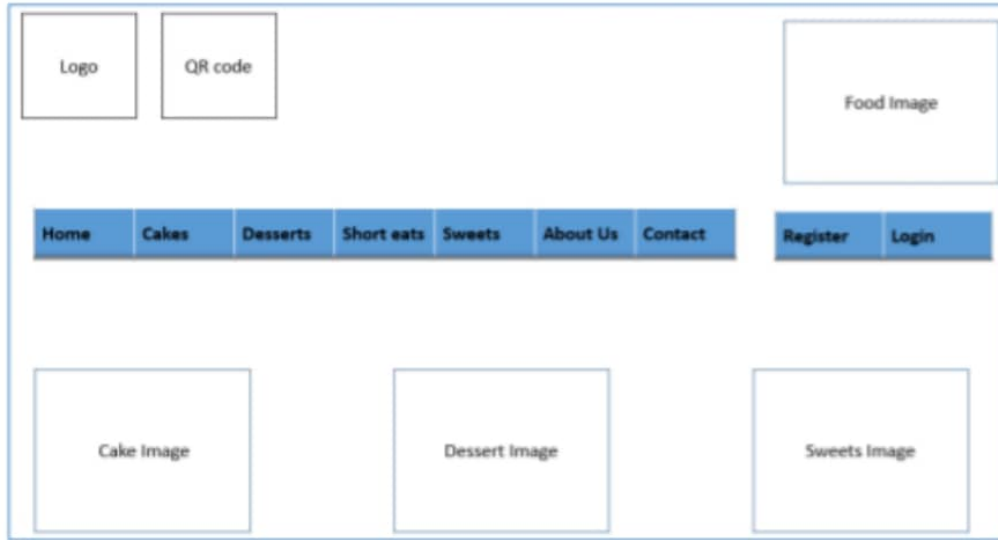


Figure 11 Customer dashboard

After accessing the customer dashboard, the customer can view the menu details and add items to the cart.

Add Edit Delete Items						
ItemCode	ItemName	ItemPrice	ItemDetails	CategoryNo	ItemImageName	Image
Edit Delete BC1	Round Natural Rose 2000		Chocolate cake with butter icing. Natural flowers	3	Baker1.jpg	
Edit Delete BC12	Tennis Court	2500	Butter icing with parchment	3	Baker11.jpg	
Edit Delete BC13	Angel Cake	2500	Butter icing with artificial ornament decor	3	Baker11.jpg	
Edit Delete BC6	Round Fancy Cake	1500	Butter cake & butter icing	3	Baker1.jpg	
Edit Delete DST2	Strawberry Delight	2000	Strawberry Tulle with jelly	3	Dc2.jpg	

Figure 12 item lists

Customers can also view their order history and track the status of their current orders.

Logout Admin Panel

Add Edit Delete Items

ItemCode	ItemName	ItemPrice	ItemDetails	Category/No Item	ImageName	Image
Edit Delete BC1	Round Natural Rose	2000	Chocolate cake with butter icing Natural flowers	3	Bc1e1.jpg	
Edit Delete BC12	Tennis Court	2100	Butter icing with parchment	3	Bc1e12.jpg	
Edit Delete BC13	Angel Cake	2500	Butter icing with artificial ornament decor	3	Bc1e13.jpg	
Edit Delete BC4	Round Fancy Cake	1500	Butter cake & butter icing	3	Bc1e4.jpg	
Edit Delete DST2	Strawberry Delight	2000	Strawberry Tuffe with jelly	3	Dst2.jpg	

Figure 13 item formatting

This system implementation and presentation of results document provides a comprehensive overview of the online food ordering system, highlighting the requirements, architecture, data flow and database structure necessary to implement the system using PHP and XAMPP.

Chapter 6

DISCUSSION, CONCLUSION, RECOMMENDATIONS, LIMITATIONS AND FUTURE WORKS

6.1 Introduction

This section presents a conclusion to the report, highlighting the summary of the results, recommendations and the way forward for the online food ordering system project built using PHP and XAMPP.

6.2 Discussion

Technology integration is becoming increasingly essential in today's fast-paced restaurant industry to improve efficiency, convenience and customer satisfaction. The major development was the introduction of an online food ordering system, which provided restaurant staff and customers with unprecedented levels of accessibility, convenience and decision-making power. This system used web technology to automate a number of tasks, such as order management and inventory tracking. This discussion examines the potential advantages, challenges and suggestions related to the adoption and use of the online food ordering system in contemporary restaurant operations.

The discussion of the findings is presented in accordance with the research objectives of the study.

Theme (Objectives)

To review the literature and determine the requirements for the development of the online food ordering system.

In the literature review, the need for an online food ordering system is established based on the evolving landscape of restaurant technology. It highlights the significance of web applications in revolutionizing traditional ordering practices, enabling restaurant owners to access vital data and insights instantly. The review identifies key components and features of online food ordering systems, emphasizing their importance in contemporary restaurant operations. Through a critical analysis of existing literature, the review levels contributions, weaknesses and gaps in the field, laying the groundwork for determining the requirements for the development of the system.

To design the online food ordering system.

Drawing upon insights from the literature review, the design phase focuses on translating specified requirements into a logical and user-friendly web application interface. User-centered design principles are applied to ensure that the system meets the needs and preferences of restaurant owners, staff and customers. The design process involves analysis of user workflows, creation of personas, user stories, journey maps and development of wireframes and interactive prototypes. The system architecture is defined to support scalability and modularity, enabling future updates and improvements.

To implement the online food ordering system.

Based on the design criteria and requirements identified in the literature review, the implementation phase involves developing the online food ordering system. Rapid Application Development (RAP) methodologies are employed to facilitate iterative development and incremental implementation of features. Frontend and Backend infrastructures are created and code is written to enable data processing, storage and communication. Testing methods, code reviews and quality assurance processes are conducted throughout the implementation phase to ensure the systems performance, functionality and dependability.

To test the online food ordering system.

During the testing phase, the online food ordering system is rigorously evaluated to ensure that it fulfills all specified requirements, works as planned and offers a positive user experience. Functional, usability, performance and security testing are conducted to verify various components of the system. Test cases are created to validate feature interactions, user authentication, data input validation and system performance.

6.3 Conclusion.

Through methodical processes that included requirement determination, system design, implementation and testing, the online food ordering system was successfully crafted to meet the changing needs of restaurant owners, staff and customers.

By conducting a thorough review of the existing literature and interacting with stakeholders, important insights were gained into the key requirements and functionalities essential for effective order management. This informed the design and development of a user-centric system that prioritizes usability, functionality and scalability.

6.4 Recommendations

Keep up with technical innovations

Restaurant owners should keep abreast of the latest developments in web technology and order management systems. Stay up date on industry publications, research papers and best practices concerning restaurant technology to take advantage of the newest instruments and solutions for enhancing operations

Engage in user feedback sessions.

Restaurant owners should participate in user feedback sessions and share their requirements, difficulties and expectations regarding order management systems. Contributing experiences, problems and ideas for enhancements can help shape the creation of intuitive and practical web applications tailored to the needs of restaurant operations.

Adopt user-centric order management solutions.

Restaurant owners should prioritize adopting user-centric order management solutions that meet their demands and preferences. Choose web applications with user-friendly interfaces, adaptable functionality and comprehensive support to enable smooth integration into restaurant routines

6.5 Limitations

Access and connectivity problems.

One of the main drawbacks of online food ordering systems is the need for reliable internet access. It may be difficult for restaurant staff to access and use the system efficiently in areas where internet availability is patchy or inconsistent.

Device compatibility.

Online food ordering systems frequently require compatible devices such as computers, tablets or smartphones. Not all restaurant owners and staff may have compatible devices or feel comfortable using web technologies. This may hinder adoption, especially among older or less tech-savvy individuals.

Data security issues.

Order management systems gather and store sensitive information on customer orders, payment transactions and other facets of restaurant operations. Protecting the security and privacy of this data is vital, but many restaurant owners could be worried about data breaches or unauthorized access to their personal information.

6.6 Future works.

Offline functionality.

Future research and development initiatives might concentrate on improving the online food ordering systems offline capabilities. Including features that allow users to access and enter data without an internet connection, especially in areas with spotty connectivity, would make these systems more reliable and accessible.

Enhancement to the user interface and experience.

Increasing the usability and adoption rates of order management apps among restaurant staff may be possible by improving the user interface and experience. This entails creating user-friendly interfaces, offering precise instructions and adding visual aids to accommodate individuals with varying degrees of technological proficiency.

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