

ONLINE FOOD ORDERING MANAGEMENT SYSTEM

By

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DECLARATION

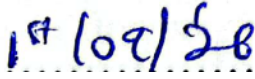
I SENYONDO IAN Registration. No. BU/UP/2023/1845 do hereby declare that this project report is original and has never been published or submitted for any other degree award to any other university before.

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APPROVAL

This project report has been submitted for examination with the approval of the following

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DEDICATION

This research project is lovingly dedicated to my cherished family, whose steadfast love, continuous support, and sacrifices have formed the basis of this work. To my parents, who devoted themselves to ensuring I received the education they were unable to fully experience; your prayers have guided me through every challenging moment. To my siblings, I am grateful for your understanding, belief in me, and for reminding me of what is truly important. To all the teachers who have ever seen potential in a student before that student recognized it in themselves, this work is a testament to your influence.

“The journey of education may be difficult, but its rewards are profound.”

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LIST OF ABBREVIATIONS

Abbreviation	Full Meaning
ICT	Information and Communication Technology
RMS	Restaurant Management System
SSAD	Structured Systems Analysis and Design
RAD	Rapid Application Development
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
UI	User Interface
UX	User Experience
GPS	Global Positioning System
API	Application Programming Interface
HTML	HyperText Markup Language
CSS	Cascading Style Sheets
PHP	PHP Hypertext Preprocessor
MySQL	My Structured Query Language
XAMPP	Cross-Platform, Apache, MySQL, PHP and Perl
WAMP	Windows, Apache, MySQL and PHP
AI	Artificial Intelligence
VS Code	Visual Studio Code
PDF	Portable Document Format
RAM	Random Access Memory
URL	Uniform Resource Locator
UGX	Uganda Shillings
PK	Primary Key
FK	Foreign Key
DBMS	Database Management System

Abstract

The rapid evolution of technology has transformed the food service industry, necessitating more efficient and user-friendly systems for managing food orders. This project proposal outlines the development of an Online Food Ordering Management System aimed at addressing the limitations of traditional food ordering methods. The system is designed to streamline the ordering process for customers while providing administrators with tools to manage food categories, track orders, and enhance overall operational efficiency.

This study identifies the challenges associated with manual food ordering systems, including long wait times, order inaccuracies, and inefficient inventory management. By implementing a centralized platform, the proposed system seeks to automate the ordering process, thereby improving customer satisfaction and reducing human errors.

The research objectives include gathering and analyzing system requirements, designing a user-friendly interface, and utilizing appropriate technologies such as PHP, HTML, CSS, JavaScript, and MySQL for implementation. The study also emphasizes the significance of real-time order tracking, secure payment systems, and data analytics to enhance user experience and operational performance.

Ultimately, this project aims to provide a practical solution that not only meets the needs of customers and food service providers but also contributes to the academic growth of the researcher by applying theoretical knowledge to real-world challenges. The findings from this study will serve as a valuable reference for future research and development in the realm of online food ordering systems.

CHAPTER ONE

Introduction

Background of the Study

In some years back, people were used to traditional methods of food management. Trade liberalization has led to a reduction in market protection. At the same time, consumers have shown growing interest in food quality, not only in terms of health and safety, but also with regard to products associated with specific geographic origins. Product origin and production processes have therefore become increasingly significant, as consumers often perceive traditional foods as higher quality due to a sense of nostalgia and connection to their cultural roots. As a result, traditional food products linked to particular regions and culinary heritage are gaining importance in the marketplace and are increasingly demanded by consumers seeking a return to tradition. These developments create growth opportunities for firms that adopt suitable strategies, particularly small enterprises operating within niche markets.

However, this resulted into the knowledge of developing “Online Food Ordering Management System” (Xavier Gellynck, Alessandro Banterle, Bianka Kuřhne, Laura Carraresi and Stefanella Stranieri, 2010). This is the system designed to be accessed online on the website by the customers and managers (administrators), that allows the admin to log in and log out, add or edit/delete new food category, see all registered customers, can block users, see orders and update orders plus generating bills in pdf format and also the users to see and search food categories, do checkouts, edit profiles, change password, see given orders and their status plus logging out. Therefore, this system is to solve many problems these includes;

- Transport Fees, moving from one’s place of work or office to the restaurant that he/she is going to make orders of lunch and breakfast.
- Congestion in restaurants by the customers due to physical orders.
- Risks of moving with cash for payments.

Problem statement.

Traditionally, food ordering and management systems at the guild canteen rely heavily on manual processes such as phone calls, paper-based records, and in-person ordering. While these methods have been used for many years, they are increasingly becoming inefficient in modern food service environments. Manual systems are time-consuming, prone to human error, and ineffective in handling large volumes of customer orders, especially during peak hours (Kimes; S, E., 2011).

Customers frequently encounter several challenges when using traditional systems. These include long waiting times, incorrect or incomplete orders, lack of real-time menu updates, and limited or inconvenient payment methods. Such inefficiencies reduce customer satisfaction and may discourage repeat business. In today's digital era, customers expect faster, more convenient, and reliable services, which manual systems often fail to provide (Ray, Dhir, Bala, & Kaur, 2019).

On the management side, traditional systems present even more significant challenges. Tracking customer orders manually can lead to misplaced or duplicated records, while inventory management becomes difficult without real-time monitoring. Additionally, handling payments manually increases the risk of errors and fraud. Generating reports for decision-making purposes is also cumbersome and often inaccurate due to poor record-keeping practices (Laudon, K. C; Laudon, J P, 2020). This lack of efficiency limits the ability of management to monitor performance, forecast demand, and improve service delivery.

Furthermore, the absence of an integrated system makes it difficult to coordinate different operations such as order processing, billing, and inventory control. This fragmentation leads to delays, miscommunication among staff, and overall operational inefficiency. As the demand for faster and more reliable services continues to grow, these challenges become more pronounced (D, Suhartanto; Helmi, Ali m; Tan, k h; Sjahroeddin, F; Kusdibyo, I, 2019).

To address these challenges, there was a need for an Online Food Ordering Management System that provides a centralized and automated platform. Such a system enabled customers to browse menus, place orders, and make payments online in a convenient and efficient manner. At the same time, it allowed administrators to manage orders, track inventory, maintain customer records, and generate accurate reports in real time.

The implementation of such a system was expected to improve order accuracy, reduce waiting times, enhance operational efficiency, and increase customer satisfaction. Additionally, it provided better data management and supported informed decision-making, thereby improving the overall performance of the guild canteen. This study therefore sought to design and develop an effective Online Food Ordering Management System to overcome the limitations of traditional food service operations.

Main Objective

- To develop a system that allows the customers to make online orders and the administrators/managers to add in new food categories at different time intervals.

Specific Objectives

- To collect and analyses system requirements from relevant stakeholders, including customers and canteen management.
- To design an efficient and user-friendly Online Food Ordering Management System.
- To implement the designed system using appropriate technologies such as PHP, HTML, CSS, JavaScript, and MySQL.
- To test and validate the performance, functionality, and usability of the developed system.

Significance

The study provided the researcher with an opportunity to apply theoretical knowledge gained in areas such as software development, database management, and system design into a practical, real-world solution. It enhanced technical competencies in programming languages such as PHP, JavaScript, HTML, CSS, and MySQL.

Additionally, the research strengthened problem-solving, critical thinking, and system analysis skills through the identification of limitations in existing platforms like Zomato and Swiggy, and the development of improved functionalities. The researcher also gained experience in handling the full system development lifecycle, including requirement gathering, design, implementation, testing, and evaluation.

Furthermore, the study contributed to the academic growth of the researcher by fulfilling partial requirements for the award of a degree, while also building a strong foundation for future professional or research work in the field of information systems.

The proposed system offered significant benefits to restaurants and food service providers by improving operational efficiency. It streamlined order management, reduces human errors associated with manual systems, and enhances communication between customers, restaurants, and delivery personnel.

Organizations also benefited from improved customer satisfaction due to features such as real-time order tracking, secure payment systems, and user-friendly interfaces. Additionally, the system provided structured financial management through automated payment processing and commission handling, enabling better accountability and transparency.

Moreover, the system supported business growth by expanding customer reach through online accessibility and data-driven insights such as customer preferences, popular menu items, and sales trends.

This study served as a valuable reference for future researchers interested in online food ordering systems or related fields. It provided insights into system design, implementation strategies, and challenges encountered during development.

Future researchers can build upon this work by improving system features, integrating emerging technologies such as artificial intelligence, machine learning, or mobile applications, and adapting the model to different industries or environments.

Additionally, the study contributed to the existing body of knowledge by presenting a structured and improved approach to addressing inefficiencies in current food ordering platforms, thereby supporting further academic exploration and innovation (Rosnan, A.N., Che Ahmat, N.H., & Norfezah, M.N. (2023), 2023).

Scope of the Online Food Ordering Management System

1. Content scope

The scope of the Online Food Ordering Management System covered the design, development, and implementation of a web-based or mobile-based platform that connects customers, restaurants, and delivery personnel within a unified digital environment. The system was intended to automate and streamline the entire food ordering and delivery process, ensuring efficiency, transparency, and convenience for all stakeholders.

The study was going to cover only two content aspects that is Food marketing and Food storage to show how food is stored before marketing it.

2. Geographical scope

The area of study was in Eastern Region of Uganda, Tororo District, at Busitema University at the guild canteen where the system will be applied but the research is crossing its boundaries in many various aspects

3. Population scope

The study covered over 300 to 350 students according to the number of customers they receive on breakfast, lunch and super as well with the university premises

CHEPTEr TWO

Literature review.

The Application of Restaurant Management Systems in the Foodservice Industry

Restaurant Management Systems (RMS) played an important role in improving the overall efficiency and performance of businesses within the foodservice industry. These systems offered specialized tools that support daily restaurant operations, such as precise monitoring of sales records including customer orders, operating expenses, revenue, and payment transactions. RMS also enabled restaurant managers to evaluate business performance using analytical reports and visual data, providing valuable insights into best-selling menu items and table turnover rates, which assist operators in making informed management decisions.

In addition, RMS simplified restaurant operations by reducing reliance on manual procedures through the integration of online ordering systems. Customers are able to view digital menus and place orders using their mobile devices. The introduction of QR code menus further enhances the dining experience by allowing customers to scan a code to access menu images, submit orders, and complete payments independently using various payment methods, including cashless options. This technology improved order accuracy, speeds up the ordering process, shortens customer waiting times, and minimizes errors that often occur with manual order processing. According to Mwanyolo (2021), the foodservice industry has increasingly adopted technological solutions such as RMS, with online ordering systems becoming a critical component of restaurant operations (Rosnan, A.N., Che Ahmat, N.H., & Norfezah, M.N. (2023), 2023) The rapid growth of digital technologies had significantly transformed the food service industry, particularly through online food ordering platforms. Several researchers have examined different aspects of these systems, including user preferences, security, tracking mechanisms, data analytics, automation, and customer engagement.

1. Customer Preferences in Online Food Ordering

The increased adoption of online food ordering systems and analyzed customer preferences. Their research identified **ease of use, reliability, and responsiveness** as key factors influenced customer satisfaction. The study emphasized the importance of intuitive user interfaces and efficient order processing mechanisms that enhanced system performance and usability.

2. Mobile Applications and Service Enhancement

Explore how mobile applications revolutionized food delivery services. Their findings highlight the importance of **mobile-first design, real-time order tracking, and personalized recommendations**. The use of push notifications was identified as a critical engagement tool that helps maintain customer interaction and improve retention rates.

3. Security in Online Payment Systems

Focus on security challenges in food ordering platforms, particularly in online payment transactions. The study discussed the implementation of **encryption techniques and secure payment gateways** to protect user data. It stressed the integration of secure APIs to ensure safe and reliable digital transactions.

4. User Experience and Application Performance

The research identified problems such as **slow loading speeds, poor navigation, and inefficient database management**. They recommended responsive UI design and optimized backend systems to improve overall user experience and customer satisfaction.

5. Real-Time Order Tracking Systems

The significance of real-time tracking in food delivery services. The study highlighted the use of **GPS integration and live status updates** to enhance transparency and reduce customer uncertainty. Accurate tracking systems were found to significantly improve trust and service reliability.

6. Data Analytics and Personalization

Discussed the application of data analytics in online food delivery platforms. Their study suggested leveraging **machine learning algorithms** to predict customer preferences and offer personalized menu recommendations. This approach was shown to increase customer loyalty and boost revenue generation.

8. Customer Feedback and Service Quality

According to Lee and Park (2020), he emphasized the integration of customer feedback mechanisms in food ordering applications. Their study highlighted the importance of **rating systems, review analysis, and sentiment analysis tools** to maintain service quality. Effective feedback systems enabled restaurants to proactively address issues and improve customer satisfaction (Dr. P. U. Anitha¹, M. Swathi², Md. Asaduddin³, B. Nagaraju⁴, K. Vikranth⁵, 2025).

CHAPTER 3

Methodology

3.2 Research Design

This study adopted the **Structured Systems Analysis and Design (SSAD)** approach. SSAD is a systematic method used in analyzing and designing information systems by breaking them down into smaller components for easier understanding and implementation (Dennis, A, Waxom, B.H., Roth, rm, 2019)

SSAD was suitable for this study because it provided a clear framework for analyzing existing systems and identifying system requirements. It also supported the use of modelling tools such as Data Flow Diagrams (DFDs), Entity Relationship Diagrams (ERDs), and flowcharts, which helped in visualizing system processes and data structures. (Dennis, A, Waxom, B.H., Roth, rm, 2019)

In addition, the study relied on **secondary data analysis**, where previously published empirical studies on online food ordering systems are reviewed. This approach allowed the researcher to build on existing knowledge and identified gaps that the proposed system will address (Johnston, 2017).

3.3 Data Sources and Collection Methods

The study primarily used **secondary data sources** obtained from published research articles related to online food ordering systems and restaurant management systems.

Relevant literature was identified through online academic databases such as Google Scholar, Academia, and ResearchGate. Keywords were used in the search include “online food ordering system,” “restaurant management system,” and “foodservice industry.”

The inclusion criteria are:

- Articles published from the year **2000 onwards**
- Articles with clear methodologies, data collection processes, findings, and implications
- Empirical research studies

The exclusion criteria include:

- Book chapters
- Short surveys
- Product reviews
- Articles without clear findings or methodology

This selection ensured that only credible and relevant sources are used in the study (Snyder, h, 2019).

3.4 System Development Methodology

The study used the **Rapid Application Development (RAD)** model to develop the system prototype. RAD emphasizes quick development and iterative prototyping with continuous user feedback (Pressman; R, S; Maxim, B R;, 2020).

RAD was appropriate because it enabled rapid system development, encouraged user involvement, supported continuous improvement, and reduced development time (Pressman; R, S; Maxim, B R;, 2020).

3.4.1 Phases of RAD

a) Requirements Planning

System requirements were identified based on literature review and user needs. Functional and non-functional requirements were defined at this stage.

b) User Design

System models and prototypes were developed using tools such as DFDs and ERDs. User feedback is incorporated to refine system design.

c) Construction

The system was developed using HTML, CSS, JavaScript (frontend), PHP (backend), and MySQL (database). Key modules included user registration, login, menu display, ordering, payment, and tracking.

d) Implementation (Cutover)

The final system was tested and deployed. Necessary adjustments were made based on testing results.

3.5 Data Analysis

Data collected from the literature was analyzed using **qualitative analysis techniques**. The researcher identified patterns, similarities, and differences among existing systems and extracts key features that contributed to system effectiveness.

The analysis focused on system functionality, user interface design, performance efficiency, and security features. This helped in designing an improved system based on proven concepts (Creswell; J, W; Creswell; J, D;, 2018).

3.6 System Design Tools

The study utilized several system design tools, including Data Flow Diagrams (DFDs), Entity Relationship Diagrams (ERDs), flowcharts, and use case diagrams. These tools helped in modelling system processes and database structures effectively (Dennis, A, Waxom, B.H., Roth, rm, 2019).

3.7 Hardware and Software Requirements

3.7.1 Hardware Requirements

- Computer with at least 4GB RAM
- Minimum 500GB storage
- Internet connection

3.7.2 Software Requirements

- Web browser (e.g., Google Chrome)
- XAMPP server
- Visual Studio Code
- Operating system (Window)

3.8 System Testing and Validation

The system undergone several testing methods, including unit testing, integration testing, system testing, and user acceptance testing. These testing methods ensured that the system was functional, reliable, and user-friendly (Pressman; R, S; Maxim, B R;, 2020)

3.9 Ethical Considerations

The study ensured proper citation of all sources to avoid plagiarism. User data privacy and system security were also considered during system development (Creswell; J, W; Creswell; J, D;, 2018).

3.10 Limitations of the Study

Some limitations include dependence on secondary data, limited access to some research materials, and time constraints (Rosnan, A.N., Che Ahmat, N.H., & Norfezah, M.N. (2023), 2023).

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN

Introduction

System design and analysis is an important phase in system development that focuses on examining user requirements and designing a system that satisfies organizational needs effectively and efficiently. System analysis involves studying the existing system, identifying its weaknesses, and determining the functional requirements of the proposed system. System design, on the other hand, involves planning the structure, components, interfaces, database, and operational procedures of the new system.

In the development of the Online Food Ordering Management System, system analysis was carried out to understand the challenges faced in manual food ordering processes such as delays, inaccurate order handling, poor record management, and limited customer interaction. The findings from the analysis guided the design of a computerized system capable of improving efficiency, reducing errors, enhancing customer service, and simplifying restaurant operations.

This chapter therefore presented the system analysis and design of the proposed Online Food Ordering Management System, including system requirements, database design, input and output design, system architecture, and interface designs used during implementation (Ray, Dhir, Bala, & Kaur,p, 2019).

The current system analysis

Current System Analysis

Before designing the new Online Food Ordering Management System, a thorough analysis of the current system was conducted to understand its strengths, weaknesses, and limitations. The existing system relies heavily on manual processes, which creates several challenges.

Manual Order Process

Currently, food orders are placed via telephone or in person at the restaurant. This results in slow order processing, frequent miscommunication, and difficulty in tracking orders accurately. Customers often have to wait long periods, especially during peak hours.

Lack of Real-Time Updates

The current system does not provide real-time updates. Customers do not receive instant confirmation of orders, nor do they have a way to track the status of their delivery. Similarly, restaurant staff lack a centralized dashboard to monitor incoming orders.

Limited Customer Interaction

Customers have minimal interaction with restaurants. Feedback is rarely collected, and there is no personalized recommendation system. This limits customer satisfaction and reduces opportunities for upselling.

Order Tracking and Data Management

In the current system, order records are often scattered across phone logs, handwritten notes,

Problem of the current system

The current food ordering system faced several challenges that affect both customers and restaurant management. These problems reduce efficiency, increase operational costs, and lower customer satisfaction.

1. Delays in Order Processing

Orders are processed manually through phone calls or physical visits, which consumes a lot of time and causes delays, especially during busy hours.

2. Inaccurate Order Handling

Manual recording of orders can lead to mistakes such as wrong food items, incorrect quantities, or missing orders.

3. Poor Record Management

The existing system lacks a proper database for storing customer and order information, making record retrieval difficult and unreliable.

4. Lack of Online Access

Customers cannot place orders remotely using mobile phones or computers, limiting convenience and accessibility.

5. Difficulty in Tracking Orders

Customers are unable to monitor the status of their orders, leading to uncertainty and dissatisfaction.

6. Limited Payment Options

The current system mainly depends on cash payments, which may inconvenience customers who prefer digital payment methods.

7. High Operational Costs

Manual operations require more workers and paperwork, increasing administrative and operational expenses.

8. Poor Communication

Miscommunication between customers and restaurant staff may occur during order placement, resulting in customer complaints.

9. Lack of Security

Manual systems do not adequately protect customer information and transaction records from loss or unauthorized access.

10. Inefficient Report Generation

Preparing sales reports, customer reports, and order summaries manually is time-consuming and prone to errors.

11. Limited Customer Satisfaction

Slow services, delayed deliveries, and inaccurate orders reduce the overall customer experience and satisfaction.

12. Difficulty in Managing Multiple Orders

Handling many customer orders simultaneously becomes difficult during peak periods, leading to confusion and delays.

Merits of the current system

Despite the challenges faced by the current food ordering system, it has some advantages that have enabled restaurants to continue operating.

1. Easy to Understand

The manual system is simple and easy for both customers and staff to use without requiring advanced technical knowledge.

2. Low Initial Setup Cost

The current system does not require expensive hardware, software, or internet infrastructure, making it affordable for small restaurants.

3. Direct Customer Interaction

Customers communicate directly with restaurant staff during ordering, which helps build personal relationships and trust.

4. Minimal Technical Requirements

The system can operate without computers, internet connectivity, or specialized training.

5. Flexible Order Handling

Restaurant staff can easily adjust customer orders manually according to customer preferences.

6. Suitable for Small Businesses

For restaurants with few customers, the manual system can effectively handle daily operations without major complications.

7. Immediate Cash Transactions

The current system supports direct cash payments, which are easy for some customers and businesses to manage.

8. No Dependence on Technology

Operations can continue even during internet failures or power interruptions since the system is mostly manual.

9. Simple Maintenance

The system requires little technical maintenance because it does not depend heavily on computerized tools.

10. Quick Staff Adaptation

New employees can easily learn and use the system within a short period of time due to its simplicity.

Requirements of the proposed system

Functional requirement

Functional requirements describe the specific functions and services that the Online Food Ordering Management System must perform to meet user needs and system objectives.

1. User Registration

The system shall allow customers to create accounts by entering personal details such as name, email address, phone number, and password.

2. User Login

The system shall allow registered users and administrators to log into the system securely using usernames and passwords.

3. Food Menu Display

The system shall display a list of available food items together with prices, descriptions, and images.

4. Search and Filter Function

The system shall allow customers to search for food items and filter them according to categories or prices.

5. Add to Cart Function

The system shall allow customers to add selected food items to a shopping cart before placing orders.

6. Order Placement

The system shall enable customers to place food orders online successfully.

7. Order Management

The system shall allow restaurant staff or administrators to receive, update, confirm, and manage customer orders.

8. Payment Processing

The system shall support payment methods such as mobile money, debit/credit cards, or cash on delivery.

9. Order Tracking

The system shall allow customers to track the progress and status of their orders in real time.

10. Delivery Management

The system shall record delivery details such as customer location and delivery status.

11. Customer Feedback

The system shall allow customers to provide feedback, ratings, and reviews about food and services.

12. Report Generation

The system shall generate reports such as sales reports, order reports, and customer activity reports.

13. Database Management: The system shall store and manage customer, order, payment, and food item information securely in the database.

14. Security and Authentication

The system shall authenticate users and protect sensitive information from unauthorized access.

15. Logout Function

The system shall allow users to log out securely after using the system.

Nonfunctional requirements

Non-functional requirements describe the quality attributes and performance standards that the Online Food Ordering Management System must achieve to operate effectively and efficiently.

1. Performance

The system should process customer requests and food orders quickly with minimal delays.

2. Reliability

The system should operate consistently without frequent failures or breakdowns.

3. Availability

The system should be accessible to users at all times, especially during business hours.

4. Security

The system should protect user accounts, passwords, and payment information from unauthorized access.

5. Usability

The system should have a simple and user-friendly interface that is easy for customers and administrators to use.

6. Scalability

The system should be able to handle an increasing number of users, orders, and restaurants without affecting performance.

7. Maintainability

The system should be easy to update, maintain, and modify whenever necessary.

8. Compatibility

The system should work properly on different devices such as computers, tablets, and smartphones, as well as various web browsers.

9. Efficiency

The system should utilize system resources such as memory, storage, and processing power effectively.

10. Backup and Recovery

The system should provide mechanisms for backing up data and recovering lost information in case of system failure.

11. Flexibility

The system should allow future improvements and integration with other technologies or payment systems.

12. Response Time

The system should respond to user actions such as login, searching, and ordering within a short period of time.

13. Accuracy

The system should ensure accurate processing of customer orders, payments, and reports.

14. Portability

The system should be deployable and usable on different operating systems and platforms.

15. Data Integrity

The system should maintain consistency and correctness of stored data at all times.

System design

4.1 Introduction

This chapter presents the design and implementation of the Online Food Ordering Management System. It provides a detailed explanation of the system architecture, data flow, core functionalities, and implementation technologies used in the development process. The design is based on the requirements identified in Chapter Three and aims to address the inefficiencies associated with traditional food ordering systems.

A well-structured system design ensures that the system meets user requirements while maintaining flexibility, efficiency, and scalability (Dennis, Wixom, & Roth, 2019). The system is therefore developed using modern web technologies to enhance usability and performance.

4.2 System Design Overview

The Online Food Ordering Management System is designed as a **web-based client-server application** that allows interaction between customers and administrators through a centralized platform.

The system architecture is divided into three main layers:

4.2.1 Presentation Layer

This layer represents the user interface through which users interact with the system. It includes:

- Login and registration or sign-up pages
- Menu browsing interface
- Order placement interface
- Administrative dashboard

The system is designed to be user-friendly and responsive, as ease of use significantly influences user satisfaction and adoption of online food ordering systems (Ray, Dhir, Bala, & Kaur, 2019).

4.2.2 Application Layer

The application layer contains the business logic of the system, implemented using PHP. It handles:

- User authentication
- Order processing
- Payment handling
- Report generation

Separating the application logic from the user interface improves system maintainability and scalability (Pressman & Maxim, 2020).

4.2.3 Data Layer

This layer manages data storage using a MySQL database. It stores:

- User information
- Menu items
- Orders
- Payment records

Effective data management ensures data integrity, accuracy, and reliability, which are essential for decision-making (Laudon, K . C; Laudon, J P;, 2020).

4.5.2 System Architecture

The system adopts a **three-tier architecture**:

1. Presentation Layer

This is what users see and interact with. It handles the UI/ UX and it is also called the client layer

For example,

- Website pages; mobile app screens, desktop interfaces
- Job; display data to the user and capture user input

2. Application Layer

This is the brain of the system. It contains business logic and processes data

For example,

- User authentication, calculations, validations and work flow.
- Job takes requests from the presentation layer, process them, and take them to the data layer

3. Database Layer

This is where data is stored and managed. It is also called database layer.

For example,

- MySQL, File storage
- Job; store, retrieve and manage data securely.

This structure enhances scalability and maintainability (Pressman & Maxim, 2020).

3 tier architecture

4.3 Data Flow Diagram (DFD)

Data Flow Diagrams (DFDs) are used to illustrate how data moves through the system and how different processes interact.

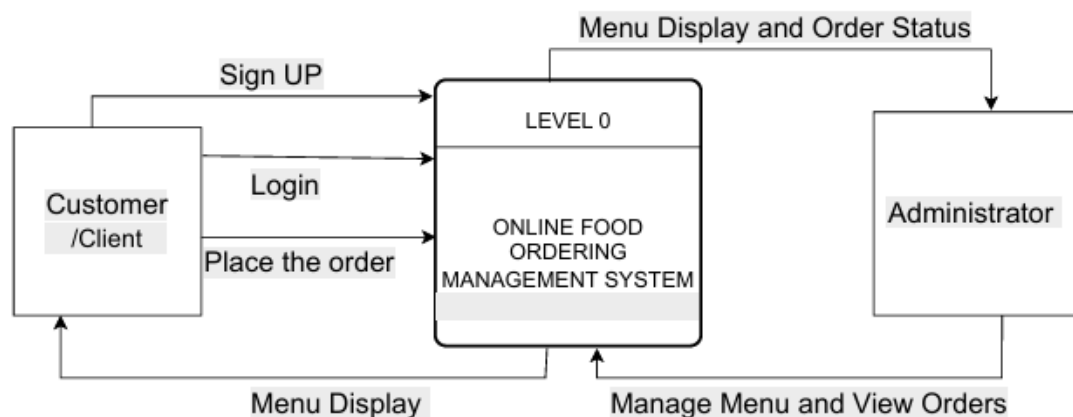
4.3.1 Level 0 DFD (Context Diagram)

The Level 0 DFD represents the system as a single process interacting with external entities.

External Entities:

- Customer
- Administrator

context diagram for ONLINE FOOD ORDERING MANAGEMENT SYSTEM



•

Main Process:

- Online Food Ordering Management System

Data Flows:

- Customer → System: Registration details, login credentials, food orders
- System → Customer: Menu display, order confirmation, order status updates

- Admin → System: Menu updates, order management inputs
- System → Admin: Reports, customer data, order information

This diagram provides a high-level overview of system interactions.

4.3.2 Level 1 DFD

The Level 1 DFD decomposes the system into key functional processes:

Processes:

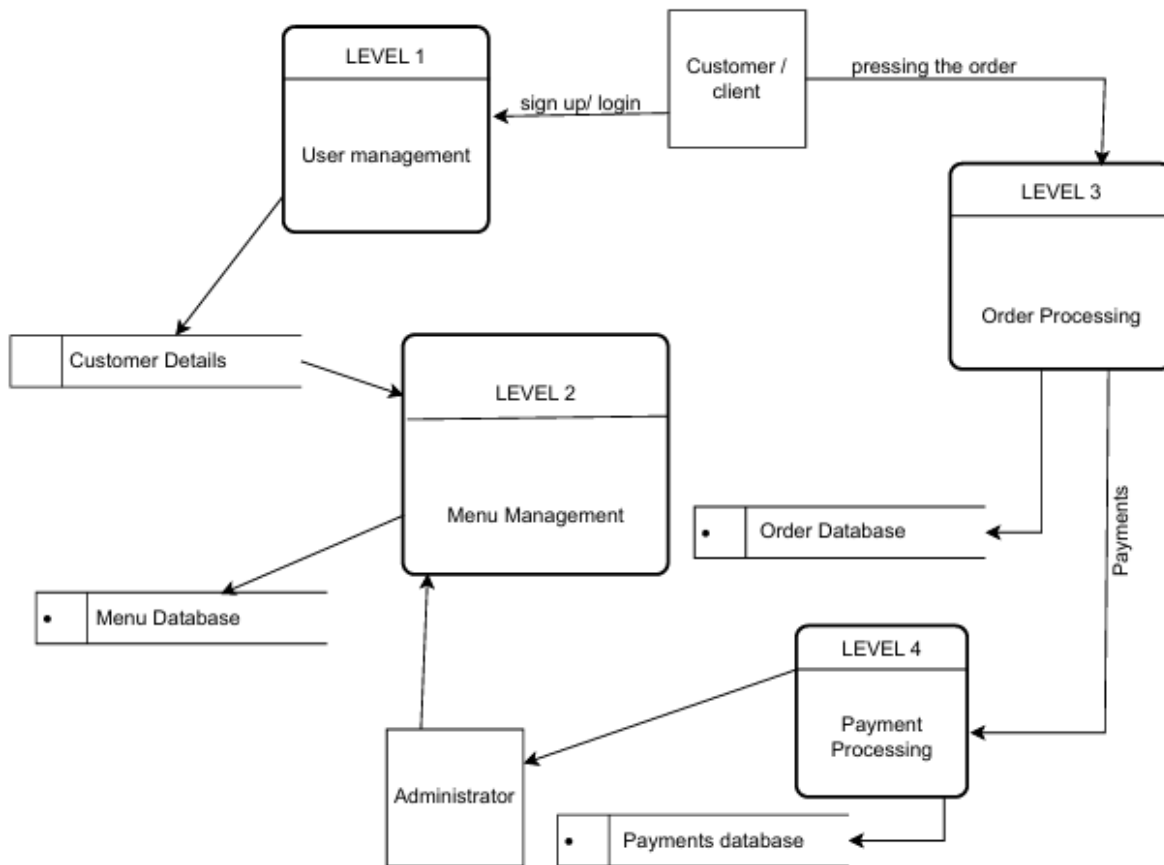
1. User Management
2. Menu Management
3. Order Processing
4. Payment Processing

Data Stores:

- User Database
- Menu Database
- Order Database
- Payment Database

Each process interacts with relevant data stores to ensure smooth data flow and system efficiency (Dennis et al., 2019).

DATA FLOW DIAGRAM FOR ONLINE FOOD ORDERING MANAGEMENT SYSTEM



4.4 Key System Features

4.4.1 User Management

The system provides role-based access control to ensure security and proper user authorization.

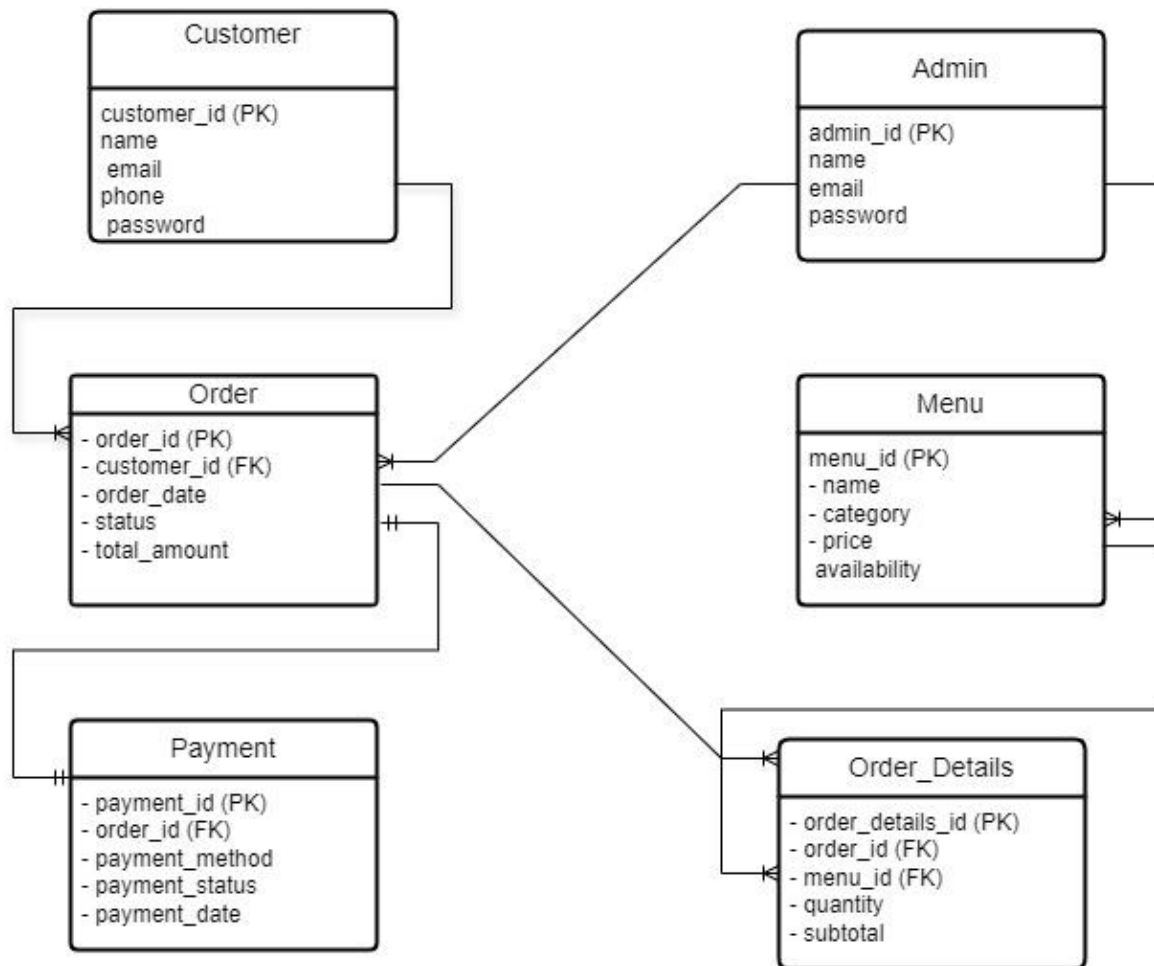
Features:

- User registration/ sign up and login
- Role differentiation (Admin and Customer)
- Profile management
- Password security

Secure systems enhance customer trust and system reliability (D, Suhartanto; Helmi, Ali m; Tan, k h; Sjahroeddin, F; Kusdibyo, I;, 2019).

Entity Relationship Diagram for Online Food Ordering Management System

ENTITY DIAGRAM FOR Online Food Ordering Management System)



Customer 1 ----- M Order

Order 1 ----- M Order Details

Menu 1 ----- M Order Details

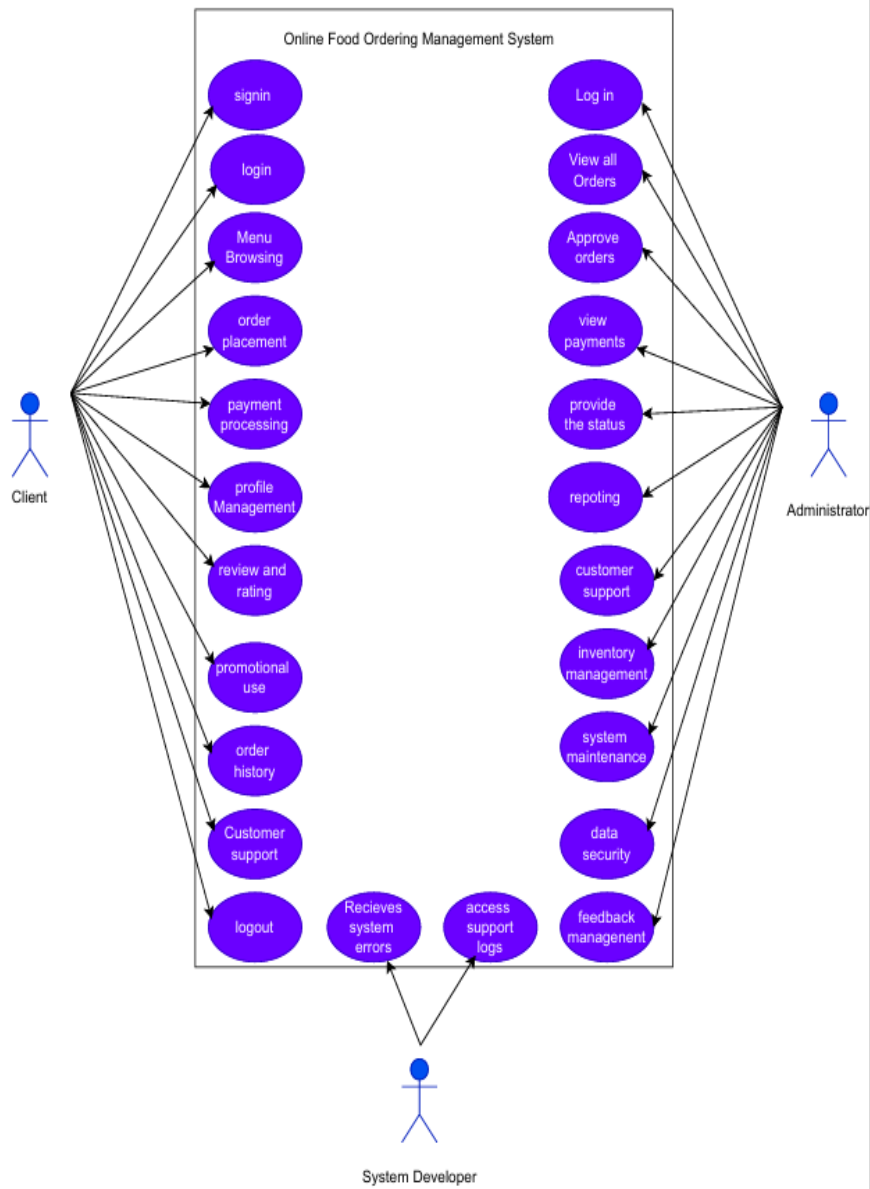
Order 1 ----- 1 Payment

Admin 1 ----- M Menu

Admin 1 ----- M Order Customer ———< Order ———< Order Details >—— Menu |

USE CASE DIAGRAM

use case diagram for Online Food Ordering Management System



MAJOR TABLES FOR THE DATABASE

Showing rows 0 - 19 (20 total, Query took 0.0003 seconds.)

```
SELECT * FROM `users`
```

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

		id	name	email	password	phone	role	status
☐	Edit Copy	1	Admin	iansenyondo10@gmail.com	\$2y\$10\$iOdVDkqabUTpkY9YobPYN.iVW1Qi.IR/6E2NsBFwa/O...	0752341143	admin	active
☐	Edit Copy Delete	2	Test Customer	customer@test.com	\$2y\$10\$2N1U/sKxwD7FwF0q3LdEguM3sE9S2I7q6O1e3X0D1S4...	+25671111111	customer	active
☐	Edit Copy Delete	3	Kitchen Staff	staff@test.com	\$2y\$10\$2N1U/sKxwD7FwF0q3LdEguM3sE9S2I7q6O1e3X0D1S4...	+25672222222	staff	active
☐	Edit Copy Delete	4	jerry	jerry@gmail.com	\$2y\$10\$ZJb1/u59kAEP3KTFNLezpeDg/Om/C2fSrlaYDnely...	0777121836	customer	active
☐	Edit Copy Delete	5	maci	maci@gmail.com	\$2y\$10\$RZ4a1SPpleEVtRgnz6w5suL/Z2Tn4.bSNzLYw06PMsv...	0777543566	customer	active
☐	Edit Copy Delete	6	wakoko ignatius	ignatiuswakoko@gmail.com	\$2y\$10\$ABqYA9tXmKLn6rV0h4NaeODc8HLNonQLN4J0Dzf92Kh...	0791178076	customer	active
☐	Edit Copy Delete	7	ADONG FELISTUS	adongfelistus232@gmail.com	\$2y\$10\$JWvPUBiZ5oL8gbEFjoW2h.npEkMy9LMCxK3NFqJnyf...	0783047399	customer	active
☐	Edit Copy Delete	8	kahlza	kahlza@gmail.com	\$2y\$10\$Gf0m6KtnK5RihA70hOIAW0aFr1A78n/GM7F7kny1dve...	0776545355	customer	active

localhost/phpmyadmin/index.php?route=/table/recent-favorite&db=food_ordering_system&table=users

Server: 127.0.0.1 » Database: food_ordering_system » Table: users

Showing rows 0 - 19 (20 total, Query took 0.0003 seconds.)

```
SELECT * FROM `users`
```

Number of rows: 25 | Filter rows: Search this table | Sort by key: None

		id	name	email	password	phone	role	status	created_at
☐	Copy Delete	1	System Admin	iansenyondo10@gmail.com	\$2y\$10\$iOdVDkqabUTpkY9YobPYN.iVW1Qi.IR/6E2NsBFwa/O...	0752341143	admin	active	2026-04-02 11:41:15
☐	Copy Delete	2	Test Customer	customer@test.com	\$2y\$10\$2N1U/sKxwD7FwF0q3LdEguM3sE9S2I7q6O1e3X0D1S4...	+25671111111	customer	active	2026-04-02 11:41:15
☐	Copy Delete	3	Kitchen Staff	staff@test.com	\$2y\$10\$2N1U/sKxwD7FwF0q3LdEguM3sE9S2I7q6O1e3X0D1S4...	+25672222222	staff	active	2026-04-02 11:41:15
☐	Copy Delete	4	jerry	jerry@gmail.com	\$2y\$10\$ZJb1/u59kAEP3KTFNLezpeDg/Om/C2fSrlaYDnely...	0777121836	customer	active	2026-04-03 15:57:06
☐	Copy Delete	5	maci	maci@gmail.com	\$2y\$10\$RZ4a1SPpleEVtRgnz6w5suL/Z2Tn4.bSNzLYw06PMsv...	0777543566	customer	active	2026-04-03 16:20:36
☐	Copy Delete	6	wakoko ignatius	ignatiuswakoko@gmail.com	\$2y\$10\$ABqYA9tXmKLn6rV0h4NaeODc8HLNonQLN4J0Dzf92Kh...	0791178076	customer	active	2026-04-03 21:47:50
☐	Copy Delete	7	ADONG FELISTUS	adongfelistus232@gmail.com	\$2y\$10\$JWvPUBiZ5oL8gbEFjoW2h.npEkMy9LMCxK3NFqJnyf...	0783047399	customer	active	2026-04-03 21:57:59
☐	Copy Delete	8	kahlza	kahlza@gmail.com	\$2y\$10\$Gf0m6KtnK5RihA70hOIAW0aFr1A78n/GM7F7kny1dve...	0776545355	customer	active	2026-04-04

User registration/ sign up page

Create an Account

Full Name

Email Address

Phone Number (Optional)

Password

Confirm Password

 Register

Already have an account? [Log in](#)

Lon in page

Welcome Back

Email Address

Password [Forgot?](#)

 Login

Don't have an account? [Sign up](#)

4.4.2 Inventory (Menu) Management

This module enables administrators to manage food items effectively.

Features:

- Add, edit, and delete menu items
- Categorization of food items
- Real-time updates of food availability
- Monitoring stock levels

Efficient inventory management helps reduce operational inefficiencies and supports better decision-making.

The screenshot displays the 'Guild Canteen' Admin Panel. The top navigation bar includes links for 'Menu', 'Cart', 'Track Order', 'Logout', and 'Admin Panel'. The left sidebar lists 'Dashboard', 'Categories', 'Menu Items', 'Inventory' (highlighted), 'Orders', and 'Users'. The main content area is titled 'Manage Inventory' and contains a table with the following data:

MENU ITEM	CURRENT STOCK	ALERT THRESHOLD	STATUS	UPDATE
Chicken Luwombo	3	3	⚠ Low Stock	Save
pilola and roasted meat	8	5	Good	Save
Kallo & Meat Stew	15	5	Good	Save
Beef Stew with Matooke	28	5	Good	Save

4.4.3 Order Management

This module manages all customer orders within the system.

Features:

- Order placement
- Order tracking
- Status updates (pending, preparing, completed)
- Order history

[Menu](#)
[Cart](#)
[Track Order](#)
[Logout](#)

Admin Panel

Admin Panel

Dashboard

Categories

Menu Items

Inventory

Orders

Users

Logout

All System Orders

All

Pending

Complete

ID	CUSTOMER	TYPE	AMOUNT	PAYMENT	DATE	STATUS MATRIX
#0039	Nakato Angella	Pickup	UGX 17,850.00	Mobile money completed	04/27 17:40	Pending
#0038	Nakato Angella	Pickup	UGX 6,300.00	Mobile money completed	04/27 17:35	Pending
#0037	noah Nabongo	Pickup	UGX 5,250.00	Mobile money completed	04/21 09:16	Pending
#0036	melanie	Delivery	UGX 28,350.00	Mobile money completed	04/21 09:05	Pending

C

Real-time order tracking improves service transparency and customer satisfaction (Ray et al., 2019).

4.4.4 Reporting and Analytics

The system provides reporting tools to assist management in decision-making.

Features:

- Sales reports
- Order trends
- Popular menu items
- Performance reports

Data-driven insights are essential for improving organizational performance (Creswell & Creswell, 2018).

4.4.5 System Administration

This module ensures effective system control and maintenance.

Features:

- User management (add/edit/delete/block users)
- System configuration

- Data backup and recovery
- System monitoring

This enhances system reliability and long-term sustainability.

CHAPTER FIVE

INTRODUCTION

This chapter presents the summary of the study, conclusions drawn from the findings, recommendations for improving the system, and suggestions for future work regarding the Online Food Ordering Management System.

The study focused on the development of an Online Food Ordering Management System aimed at improving the efficiency of food ordering and delivery services. The existing manual system was analyzed and several weaknesses were identified, including delays in order processing, poor record management, inaccurate order handling, and lack of online access.

To solve these problems, a computerized system was designed and implemented. The proposed system allows customers to register, log in, browse food menus, place orders online, make payments, and track their orders. Administrators are also able to manage food items, customer records, payments, and generate reports efficiently.

The system was developed using modern web technologies and tested successfully to ensure proper functionality, reliability, and usability.

Output design and input design

4.5 Input Design

Input design refers to the process of designing methods and procedures for capturing and entering data into the system accurately and efficiently. Proper input design helps reduce errors, improve data accuracy, and enhance system usability.

In the Online Food Ordering Management System, the following inputs are required:

1. Customer Registration Input

Customers enter personal details such as:

- Full name
- Email address
- Phone number
- Password

2. Login Input

Users provide:

- Username or email
- Password

3. Food Order Input

Customers select and enter:

- Food items
- Quantity
- Delivery address
- Special instructions

4. Payment Input

Customers provide payment details such as:

- Payment method
- Mobile money number or card details
- Transaction confirmation

5. Food Management Input

Administrators enter:

- Food names
- Prices
- Food descriptions
- Food images

6. Feedback Input

Customers submit:

- Ratings
- Comments
- Reviews

Features of Good Input Design

- Easy to use forms
- Input validation to reduce errors
- Clear labels and instructions
- Secure handling of sensitive data

4.6 Output Design

Output design refers to the process of presenting processed information to users in a useful and understandable format. The outputs generated by the system help users make decisions and monitor operations effectively.

The Online Food Ordering Management System produces the following outputs:

1. Order Confirmation Output

The system generates order confirmation messages showing:

- Order number
- Ordered items
- Total cost
- Delivery details

2. Payment Receipt Output

Customers receive payment receipts containing:

- Payment amount
- Transaction ID
- Payment date and time

3. Customer Order History

The system displays previous customer orders and their status.

4. Sales Reports

Administrators can generate reports showing:

- Daily sales
- Weekly sales
- Monthly sales

5. Food Inventory Reports

The system provides reports on available food items and stock levels.

6. Delivery Status Output

Customers can view delivery progress such as:

- Order received
- Food being prepared
- Out for delivery

- Delivered

Characteristics of Good Output Design

- Clear and understandable
- Accurate and timely
- Well formatted
- Easy to access
- Relevant to user needs

Feature of the login page

Features of the Login Page

The login page is an important part of the Online Food Ordering Management System that allows authorized users to access the system securely. The following are the main features of the login page:

1. Username or Email Field

The login page provides a field where users enter their username or email address.

2. Password Field

Users enter their password in a secure password input field where characters are hidden for privacy.

3. Login Button

The login button allows users to submit their credentials and access the system.

4. Password Encryption

The system encrypts passwords to improve security and protect user information.

5. Input Validation

The login page validates entered information to ensure that fields are not left empty and that correct data is entered.

6. Forgot Password Option

Users who forget their passwords can reset or recover them through the forgot password feature.

7. Remember Me Option

The system may provide a “Remember Me” feature to keep users logged in on trusted devices.

8. Error Messages

The system displays appropriate error messages when invalid login credentials are entered.

9. User Authentication

The login page verifies user identity before granting access to the system.

10. Secure Access Control

Only authorized users such as customers, administrators, and restaurant staff can access specific system functions.

11. Responsive Design

The login page is designed to work properly on computers, tablets, and smartphones.

12. Logout Feature

Users can securely log out of the system after completing their activities.

Image of User registration /sign up

Create an Account

Full Name
John Doe

Email Address
john@canteen.edu

Phone Number (Optional)
+256 7xx xxx xxx

Password
Create a password

Confirm Password
Confirm your password

Register

Already have an account? [Log in](#)

User login page

The user or an admin Login in the system after signing up the above sign in page. Since his or her credentials are already stored in the system's database

Welcome Back

Email Address

Password [Forgot?](#)

[→ Login](#)

Don't have an account? [Sign up](#)

System inventory management

 **Guild Canteen**

Menu  Cart Track Order Logout [Admin Panel](#)

Admin Panel

 Dashboard

 Categories

 Menu Items

 **Inventory**

 Orders

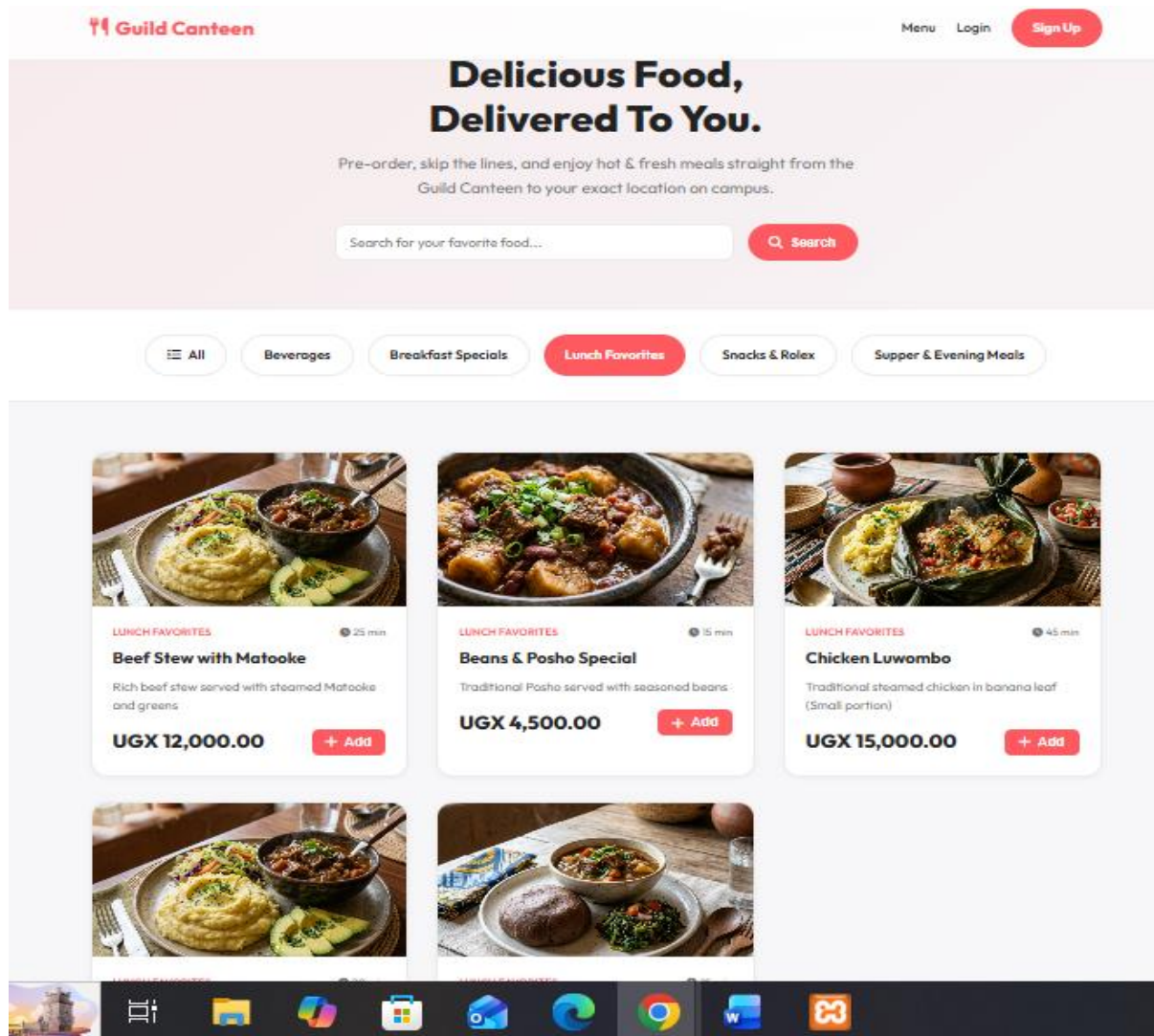
 Users

Manage Inventory

MENU ITEM	CURRENT STOCK	ALERT THRESHOLD	STATUS	UPDATE
Chicken Luwombo	3	3	⚠ Low Stock	Save
pilola and roasted meat	8	5	Good	Save
Kallo & Meat Stew	15	5	Good	Save
Beef Stew with Matooke	28	5	Good	Save

Onscreen images

The picture of the system enabling the users to navigate in the system to place their food choice on the menu



Category management

Manage Categories

Add New Category

Category Name

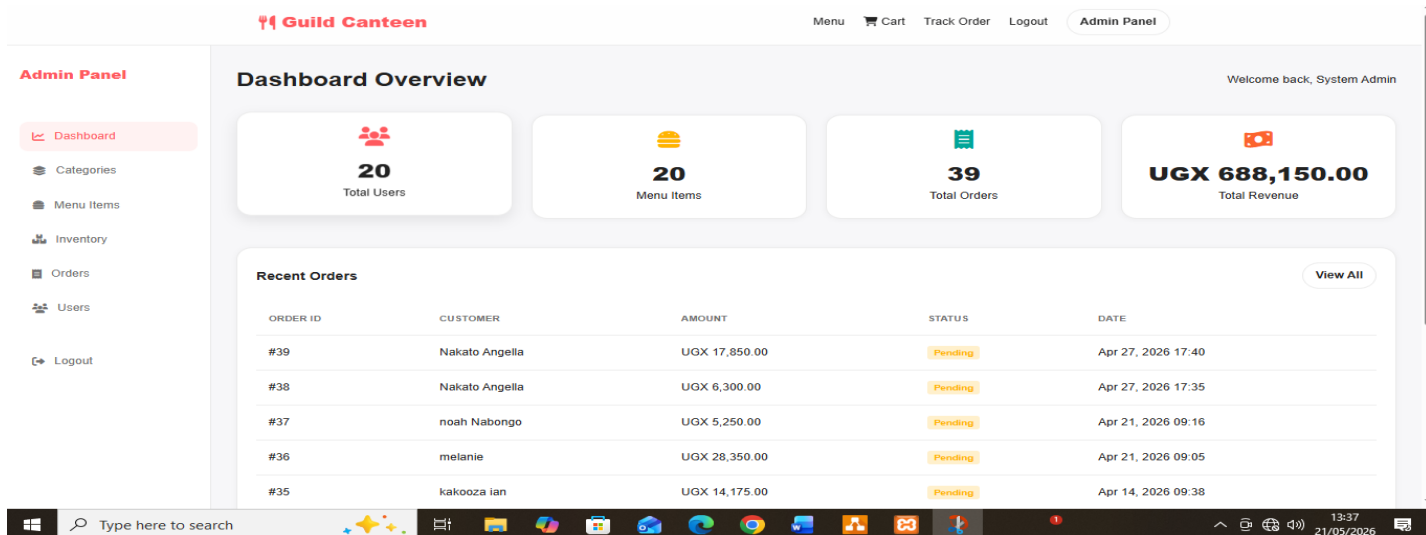
Description

Add Category

Existing Categories

NAME	DESCRIPTION	ACTIONS
Beverages	Refreshing hot and cold drinks	
Breakfast Specials	Morning meals ranging from 1,500 to 4,000 UGX	
Lunch Favorites	Hearty local dishes and stews ranging from 3,000 to 15,000 UGX	
Snacks & Rolex	Quick bites and the famous Ugandan Rolex	
Supper & Evening Meals	Lighter evening meals ranging from 3,000 to 8,000 UGX	

System's Dashboard



All System Orders

							All	Pending	Completed
ID	CUSTOMER	TYPE	AMOUNT	PAYMENT	DATE	STATUS MATRIX			
#0039	Nakato Angella	Pickup	UGX 17,850.00	Mobile money completed	04/27 17:40	Pending	▼	🔒	
#0038	Nakato Angella	Pickup	UGX 6,300.00	Mobile money completed	04/27 17:35	Pending	▼	🔒	
#0037	noah Nabongo	Pickup	UGX 5,250.00	Mobile money completed	04/21 09:16	Pending	▼	🔒	
#0036	melanie	Delivery	UGX 28,350.00	Mobile money completed	04/21 09:05	Pending	▼	🔒	
#0035	kakooza ian	Delivery	UGX 14,175.00	Mobile money completed	04/14 09:38	Pending	▼	🔒	
#0034	kitchen	Pickup	UGX 33,075.00	Cash pending	04/14 00:51	Pending	▼	🔒	
#0033	absa mudungu	Delivery	UGX 50,925.00	Mobile money completed	04/08 14:53	Pending	▼	🔒	

Coding and testing

4.8.1 Coding

Coding refers to the process of writing program instructions using programming languages in order to develop the Online Food Ordering Management System. During system development, different programming tools and technologies were used to implement the designed functionalities of the system.

The system was developed using modern web technologies to ensure efficiency, reliability, and user friendliness.

Programming Languages and Tools Used

Tool/Language	Purpose
HTML	Designing web page structure
CSS	Styling and formatting web pages
JavaScript	Adding interactivity and client-side validation
PHP/ Java	Backend processing and server-side operations
MySQL	Database management
XAMPP/WAMP	Local server environment

Coding Modules Developed

The following modules were coded and integrated into the system:

1. User Registration Module: Handles customer account creation.
2. Login Module: Authenticates users and controls access.
3. Food Menu Module: Displays available food items and prices.
4. Order Processing Module: Handles customer orders and order tracking.
5. Payment Module: Processes customer payments.
6. Administration Module: Allows administrators to manage users, food items, and reports.

Advantages of Proper Coding

- Improves system performance
- Reduces system errors
- Enhances security
- Simplifies maintenance and updates

4.8.2 System Testing

System testing refers to the process of evaluating the system to ensure that it functions correctly according to user requirements. Testing was conducted to identify and correct errors before system deployment.

Types of Testing Conducted

1. Unit Testing

Individual modules were tested separately to verify that each function works correctly.

2. Integration Testing

Different modules were combined and tested together to ensure smooth interaction between components.

3. System Testing

The entire system was tested as a whole to confirm that all functionalities operate properly.

4. User Acceptance Testing

Potential users tested the system to verify whether it meets their needs and expectations.

4.8.3 Test Cases and Results

Test Case	Expected Result	Actual Result	Status
User Registration	User account created successfully	Successful	Pass
User Login	User accesses the system	Successful	Pass
Place Order	Order stored in database	Successful	Pass
Payment Processing	Payment recorded correctly	Successful	Pass
Logout	User exits system securely	Successful	Pass

4.8.4 Importance of Testing

- Helps identify system errors
- Ensures system reliability
- Improves system security
- Enhances user satisfaction
- Confirms that the system meets requirements

4.8.2 System Integration

System integration is the process of combining all individual modules of the Online Food Ordering Management System to work together as one complete system. After coding different components separately, they were integrated to ensure smooth communication and proper functionality between all parts of the system.

4.8.2.1 Purpose of System Integration

The main purpose of system integration is to ensure that all modules interact correctly and share data efficiently without errors or conflicts.

4.8.2.2 Integrated Modules

The following modules were integrated in the system:

1. User Management Module: Integrated with login, registration, and authentication functions.
2. Food Menu Module: Connected to the database to display updated food items and prices.

3. Cart and Order Module: Integrated with user accounts and food menu to allow order placement.
4. Payment Module: Linked with order module to process and confirm payments.
5. Admin Module: Connected to all system components for managing users, orders, and food items.
6. Notification Module: Sends order confirmations and status updates to users.

4.8.2.3 Integration Process

The integration process was carried out in stages:

- First, individual modules were tested separately (unit testing).
- Second, related modules were combined and tested (sub-system integration).
- Finally, all modules were merged into one complete system (system integration testing).

4.8.2.4 Challenges Faced During Integration

- Compatibility issues between different modules
- Data transfer errors between system components
- Minor bugs during module communication
- Synchronization issues between database and application layer

4.8.2.5 Solutions to Integration Problems

- Proper debugging and error correction
- Standardizing data formats across modules
- Improving database connection handling
- Continuous testing during integration stages

4.8.2.6 Conclusion

System integration ensured that all modules of the Online Food Ordering Management System work together efficiently as a single system. This improved system performance, reliability, and ensured smooth user experience.

System Operation and Maintenance

System operation and maintenance refer to the activities carried out after the Online Food Ordering Management System has been implemented in order to ensure it runs smoothly, efficiently, and continuously meets user requirements.

4.9.1 System Operation

System operation involves the day-to-day use of the system by users such as customers, administrators, and restaurant staff.

1. User Operation

Customers operate the system by:

- Registering and logging into the system
- Browsing food menus
- Placing orders
- Making payments
- Tracking order status

2. Administrator Operation

Administrators are responsible for:

- Managing user accounts
- Adding, updating, and deleting food items
- Monitoring and managing orders
- Generating system reports
- Handling customer feedback

3. Restaurant Staff Operation

Staff members use the system to:

- Receive and confirm orders
- Update order status (preparing, ready, delivered)
- Communicate order information to delivery personnel

4. System Monitoring

The system is regularly monitored to ensure:

- Proper performance
- Security of data
- Smooth order processing
- Availability of services

4.9.2 System Maintenance

System maintenance involves updating and improving the system to ensure it continues to function correctly and efficiently.

1. Corrective Maintenance

This involves fixing errors and bugs discovered during system operation.

2. Adaptive Maintenance

The system is modified to work in new environments such as updated browsers, devices, or operating systems.

3. Perfective Maintenance

Improvements are made to enhance system performance, usability, and efficiency based on user feedback.

4. Preventive Maintenance

Actions are taken to prevent future system failures, such as database backups and security updates.

4.9.3 Importance of Maintenance

- Ensures system reliability and stability
- Improves system performance over time
- Enhances security against threats
- Fixes bugs and errors
- Adapts the system to new user needs and technologies

4.9.4 Conclusion

System operation and maintenance are essential for the long-term success of the Online Food Ordering Management System. Proper operation ensures efficient daily use, while maintenance guarantees continuous improvement, reliability, and security of the system.

CHAPTER SIX

DISCUSSION, CONCLUSION IMPLEMENTATION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the discussion of the system development process, the conclusions drawn from the study, and the recommendations for improving the Online Food Ordering Management System. It also highlights possible future enhancements to make the system more efficient and user-friendly.

6.1 Implementation

The implementation phase involved converting the system design into a fully functional Online Food Ordering Management System. During this phase, the system modules were developed, integrated, tested, and deployed to ensure that they met the specified requirements.

The system was implemented as a web-based application using modern web development technologies. The front-end interface was developed using HTML, CSS, and JavaScript to provide an interactive and user-friendly environment for customers, restaurant staff, and administrators. The back-end was developed using server-side scripting technologies and connected to a relational database management system for data storage and retrieval.

The implementation process involved the following activities:

1. Database Creation

- Designing and creating database tables for users, food items, orders, payments, and delivery information.
- Establishing relationships between tables to ensure data integrity and consistency.

2. User Interface Development

- Developing customer registration and login pages.
- Designing menu display pages for browsing food items.
- Creating order placement and checkout interfaces.

3. Administrator Module Implementation

- Developing functionalities for managing food menus.
- Implementing order monitoring and management features.
- Creating report generation and user management modules.

4. Order Management Module

- Allowing customers to place food orders online.
- Processing and recording customer orders in the database.
- Updating order status from placement to delivery.

5. Payment Module

- Implementing payment processing functionalities.
- Recording payment transactions and generating payment confirmations.

6. System Testing and Integration

- Conducting unit testing on individual modules.
- Performing integration testing to ensure communication between modules.
- Correcting identified errors and improving system performance.

7. Deployment

- Installing the system on a web server environment.
- Configuring database connections and system settings.
- Making the system accessible to authorized users through a web browser.

The implementation process was successfully completed, and the system was able to perform all major functions including user registration, food browsing, order placement, payment processing, order tracking, and administrative management. The results obtained from testing confirmed that the system met the objectives and requirements specified during the analysis and design phases.

6.1 Discussion

The development of the Online Food Ordering Management System was aimed at solving the challenges faced in the traditional manual food ordering process. The system analysis revealed several problems such as delays in order processing, inaccurate order handling, poor record management, and lack of real-time order tracking.

The proposed system was designed and implemented to address these issues by introducing an automated and web-based solution. The system allows users to register, log in, browse food menus, place orders, make payments, and track orders efficiently. Administrators can also manage food items, orders, users, and generate reports.

During implementation, various technologies were used including HTML, CSS, JavaScript, server-side scripting languages, and a database management system. Testing and integration ensured that the system functions correctly and meets user requirements.

Overall, the system significantly improves efficiency, accuracy, and convenience compared to the manual system.

6.4 Future Scope and Applications

The Online Food Ordering Management System has been developed as a web-based platform to improve efficiency in food ordering and restaurant management. However, there are several opportunities for future enhancement and wider application.

6.4.1 Future Scope

The system can be improved and expanded in the following ways:

1. Mobile Application Development

A mobile app version (Android and iOS) can be developed to make the system more accessible and convenient for users.

2. Integration of Artificial Intelligence

AI can be used to provide personalized food recommendations based on customer preferences and order history.

3. GPS Tracking System

Real-time delivery tracking can be added so that customers can monitor the exact location of their orders.

4. Chatbot Support

A chatbot can be integrated to assist customers with orders, complaints, and inquiries instantly.

5. Multi-Restaurant Platform

The system can be expanded into a platform where multiple restaurants operate under one system, similar to large food delivery services.

6. Advanced Payment Systems

Future improvements may include integration of secure digital wallets, mobile money services, and cryptocurrency payments.

7. Data Analytics and Reporting

Advanced analytics can be added to help restaurant owners analyze customer behavior, sales trends, and performance reports

6.4.2 Applications of the System

The system was applied in various real-world environments such as:

1. Restaurants

Used to manage food orders, customer requests, and payment processing efficiently.

2. Hotels

Helped in managing room service food ordering and customer dining services.

3. Fast Food Chains

The system was effectively used in fast food restaurants to improve the speed and efficiency of order processing. It helped customers place orders quickly without waiting in long queues, especially during peak hours.

Software scope

6.5 Software Scope

The Software Scope defined the boundaries, functionalities, and extent of the Online Food Ordering Management System. It explained what the system was intended to do and the areas it covered within the food ordering and management domain.

6.5.1 System Scope

The Online Food Ordering Management System was designed as a web-based application that facilitated interaction between customers, restaurants, and administrators. The system focused on automating food ordering processes, improving service delivery, and reducing manual workload.

The system covered the following major areas:

- Customer registration and authentication
- Online food browsing and selection
- Order placement and management
- Payment processing
- Order tracking and delivery updates
- Administrative control and reporting

6.5.2 Functional Scope

The system performed the following core functions:

- Allows users to create accounts and log in securely
- Displayed available food items with descriptions and prices
- Enabled customers to place and manage orders online
- Allowed administrators to manage food menus and orders

6.5.3 User Scope

The system is designed for the following users:

- Customers: to browse menus, place orders, and track deliveries
- Administrators: to manage the system, users, and reports
- Restaurant Staff: to process and update order status

6.5.4 Geographical Scope

The system was accessible anywhere with internet connectivity, making it suitable for local, regional, and potentially global use depending on deployment.

6.5.5 Limitations of Scope

The current version of the system did not include:

- Physical delivery management using GPS tracking (if not implemented)
- Advanced AI recommendation systems
- Multi-language support (unless added)
- Offline functionality

6.5.6 Conclusion

The software scope clearly defines the capabilities and boundaries of the Online Food Ordering Management System. It focuses on improving efficiency in food ordering processes while leaving room for future expansion and enhancement.

6.6 Challenges and Limitations

During the development and implementation of the Online Food Ordering Management System, several challenges and limitations were encountered. These affected the design process, system performance, and overall implementation.

6.6.1 Challenges

1. Requirement Gathering Difficulties

It was challenging to collect complete and accurate requirements from users due to differences in expectations and understanding of the system.

2. Time Constraints

The development process was limited by time, making it difficult to implement all planned features within the required period.

3. Technical Complexity

Some system functionalities such as order processing, payment integration, and database connectivity required advanced technical skills.

4. Integration Issues

Combining different modules such as user management, orders, and payments sometimes led to compatibility and communication problems between components.

5. Database Design Challenges

Designing an efficient and normalized database structure that avoids redundancy and ensures data integrity was challenging.

6. Testing Difficulties

Ensuring that all modules work correctly under different conditions required repeated testing and debugging.

6.6.2 Limitations

1. Internet Dependency

The system requires a stable internet connection to function, limiting access in areas with poor connectivity.

2. Limited Payment Integration

The system may support only basic payment methods, restricting user flexibility.

3. No Advanced AI Features

The current system does not include intelligent recommendation systems or predictive analytics.

4. Limited Scalability (Initial Version)

The system may face performance issues if the number of users increases significantly without optimization.

5. Security Constraints

Although basic security measures are implemented, advanced security features such as two-factor authentication may not be included.

6. Lack of Mobile Application

The system is primarily web-based and may not provide the same convenience as a dedicated mobile application.

6.6.3 Conclusion

Despite the challenges and limitations, the system was successfully developed and meets its primary objectives. The identified limitations provide opportunities for future improvements and system enhancement.

6.7 Recommendations

Based on the development, implementation, and evaluation of the Online Food Ordering Management System, the following recommendations are proposed to improve its efficiency, usability, and overall performance.

1. System Upgrade and Enhancement

The system should be regularly upgraded to include new features such as advanced search, improved user interface, and faster processing capabilities.

2. Mobile Application Development

A mobile application should be developed to complement the web system, making it easier for users to place orders anytime and anywhere.

3. Improved Payment Integration

The system should integrate multiple secure payment options such as mobile money, bank cards, and digital wallets to enhance user convenience.

4. Enhanced Security Measures

Stronger security mechanisms such as two-factor authentication, data encryption, and secure payment gateways should be implemented to protect user data.

5. Real-Time Order Tracking

The system should include GPS-based tracking to allow customers to monitor their food delivery status in real time.

6. Regular Maintenance

Routine system maintenance should be carried out to fix bugs, improve performance, and ensure system reliability.

7. User Training

Restaurant staff and administrators should be trained on how to effectively use and manage the system to maximize its benefits.

8. Scalability Improvement

The system should be optimized to handle a larger number of users and orders without affecting performance.

9. Data Backup and Recovery

A proper backup system should be implemented to prevent data loss and ensure quick recovery in case of system failure.

10. Future Integration

The system should be designed in a way that allows integration with third-party services such as delivery companies, analytics tools, and AI-based recommendation systems.

6.8 Conclusion

Implementing these recommendations will significantly improve the performance, reliability, and usability of the Online Food Ordering Management System, ensuring it remains efficient and relevant in the future.

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APPENDIX

A.0 Introduction

The appendix section contains supplementary information that supports the development and understanding of the Online Food Ordering Management System. It includes sample interfaces, database structures, system tools, and other technical materials used during the development process.

WORK PLAN Project Duration: 16 Weeks

Activity	Week 1-2	Week 3-4	Week 5-6	Week 7-8	Week 9-10	Week 11-12	Week 13-14	Week 15-16
Proposal Writing and Approval	✓	✓						
Literature Review	✓	✓	✓					
Requirements Gathering and Analysis		✓	✓					
System Design (DFD, ERD, Flowcharts)			✓	✓				
Database Design			✓	✓				
System Coding and Development				✓	✓	✓		
System Testing and Debugging					✓	✓		
System Implementation						✓	✓	
Report Writing						✓	✓	✓
Final Submission and Presentation								✓

PROJECT BUDGET

Item	Amount (UGX)
Printing and Photocopying	10,000
Internet/Data Bundles	15,000
Transport	20,000
Stationery (Pens, Papers, Notebook)	10,000
Flash Disk	15,000
Typing and Editing	10,000
Binding of Final Report	10,000
Contingency Expenses	10,000
Total Budget	100,000

A.1 Sample System Interfaces

The following are the main interfaces developed in the system:

- Login Page Interface
- User Registration Page
- Food Menu Page
- Shopping Cart Page
- Checkout/Payment Page
- Admin Dashboard Interface
- Order Management Interface

A.2 Sample Database Tables

Users Table

Field	Type	Description
user_id	INT	Primary key
Name	VARCHAR	Full name of user
Email	VARCHAR	User email
password	VARCHAR	Encrypted password
Phone	VARCHAR	Contact number

Food Items Table

Field	Type	Description
food_id	INT	Primary key
food_name	VARCHAR	Name of food
Price	DOUBLE	Cost of food
description	TEXT	Food details

Orders Table

Field	Type	Description
order_id	INT	Primary key
user_id	INT	Foreign key
order_date	DATE	Date of order
total_amount	DOUBLE	Total cost
Status	VARCHAR	Order status

A.3 Tools and Technologies Used

The system was developed using the following tools:

- HTML – for webpage structure
- CSS – for styling user interface
- JavaScript – for interactivity
- PHP / Python – for backend processing
- MySQL – for database management
- XAMPP/WAMP – local server environment
- VS Code – code editor

A.4 System Flow Summary

1. User registers an account
2. User logs in
3. User browses food menu
4. User adds items to cart
5. User places order

6. System processes order
7. Payment is made
8. Order is delivered and updated

A.5 Sample Output Reports

- Daily Sales Report
- Monthly Order Summary
- Customer Activity Report
- Food Popularity Report

A.6 Conclusion

The appendix provides additional supporting materials that help to understand the structure, functionality, and implementation of the Online Food Ordering Management System. It complements the main chapters of the report and gives a clearer technical overview of the system.

4.5 System Implementation

4.5.1 Development Tools and Technologies

The system is implemented using:

- **Frontend:** HTML, CSS, JavaScript
- **Backend:** PHP
- **Database:** MySQL
- **Server Environment:** XAMPP

These technologies were selected due to their flexibility and compatibility in web-based system development.

4.5.3 Implementation Model

The system was developed using the **Rapid Application Development (RAD)** model.

RAD allows:

- Quick system development
- Continuous user feedback
- Iterative improvements

This approach is suitable for dynamic systems requiring frequent updates (Pressman & Maxim, 2020).

4.6 Security Considerations

The system incorporates several security measures:

- Password encryption
- Secure authentication
- Role-based access control
- Data protection mechanisms

These measures help reduce risks associated with unauthorized access and data breaches (Laudon, K . C; Laudon, J P;, 2020).

4.7 Conclusion

This chapter has presented the system design and implementation of the Online Food Ordering Management System. It has discussed system architecture, data flow diagrams, and key system features. The design ensures efficiency, usability, and security while addressing challenges identified in traditional systems.

The next chapter will focus on system testing and evaluation.