WEB BASED CAKE ODERING AND RESERVATION BOOKING SYSTEM FOR FIAM BAKES

CASE STUDY: FIAM BAKES MASAKA

BY

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DICATION

This project is dedicated to my family (Agaba Fiona, Atuheire Juliet and Nalwoga Winfred Mmamba, Munanura Edwin) and my friends (Wandeba Joel Mathias, Agumya Brian, John Pual, Ssekasanvu Brian, Ssemakula Reagan, Malongo Justine) for their unwavering support and encouragement. Their belief in me has been my constant source of inspiration.

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ABSTRACT

The terms "order" and "reservation" refer to the process of requesting a product or service and booking in advance to secure it, respectively. The primary goal of an ordering and reservation system is to facilitate these processes efficiently for both the service provider and the customer. This project is about developing a Cake Ordering and Reservation Booking System for small bakeries, using Fiam Bakes as the case study. This study examined the challenges faced by the bakery's management, staff, and customers during the ordering and reservation processes. It focuses on how the bakery can leverage Information Technology to manage its orders and reservations effectively. This study therefore provides insights on how best small bakeries can manage their ordering and reservation processes.

Many ordering and reservation systems have failed to meet customer expectations. Efficiency and user-friendliness are major concerns, prompting significant research interest in recent years. In Uganda, developing appropriate and scalable systems for small businesses has been challenging. Traditional paper-based ordering systems currently used are associated with problems such as order mix-ups, reservation conflicts, and inefficient record-keeping.

This system was developed using HTML and PHP as the programming languages and MySQL as the database management system. The development process included designs covering the system architecture, user interfaces, and database design.

At the end of the project, a Cake Ordering and Reservation Booking System for Fiam Bakes, which was the case study, was successfully developed.

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CHAPTER ONE

1.0 Introduction

This chapter covers the background of the study, problem statement, general objective, specific objectives, scope, and finally the significance of the proposed solution to the identified problem.

The objective of a cake ordering and reservation system is to allow customers to place orders and make reservations efficiently, ensuring they receive their desired products and services at the right time. Effective ordering and reservation systems are essential for small businesses like Fiam Bakes to manage customer expectations and improve operational efficiency (Nsubuga, et al., 2020).

According to Mugisha, et al. (2018), small businesses in Uganda, including bakeries, face significant challenges in managing customer orders and reservations due to manual processes. Implementing an electronic system can streamline these processes, reduce errors, and enhance customer satisfaction.

A Cake Ordering and Reservation Booking System is an electronic method that allows customers to place orders and make reservations remotely. In this system, all customer requests are processed and stored in a central database, enabling the bakery to manage orders and reservations without the need for physical paperwork (Kiconco & Namata, 2019).

Electronic ordering and reservation technology can include web-based platforms, mobile applications, and automated messaging systems. It can also involve real-time updates and notifications to both the customer and the bakery staff (Ssenyonga, 2017). The advantage of an online system over traditional methods is that customers can place orders and make reservations at their convenience, reducing the likelihood of double bookings and lost orders (Nabirye, et al., 2016).

Implementing online ordering and reservation systems comes with several challenges, which can determine the success or failure of the system. These challenges include system security, user authentication, data privacy, and system reliability (Tumusiime, et al., 2018). Security ensures that customer data is protected from unauthorized access. Authentication guarantees that only legitimate users can access the system. Privacy safeguards customer information,

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ensuring it is not disclosed to unauthorized parties, and system reliability ensures that the service is available when needed (Mukasa, et al., 2019).

1.1 Background of the Study

Efficient management of orders and reservations is crucial for small businesses like bakeries. In modern business practices, an effective system ensures customer satisfaction and operational efficiency. This project focuses on developing a Cake Ordering and Reservation Booking System for Fiam Bakes, a small bakery in Masaka District, Uganda. This study investigates the challenges faced by the bakery in handling orders and reservations manually and explores how leveraging Information Technology can address these challenges (Nsubuga, et al., 2020).

According to Mugisha, et al. (2018), small businesses in Uganda, including bakeries, often struggle with manual processes that lead to order mix-ups, reservation conflicts, and inefficient record-keeping. Implementing an electronic system can streamline these processes, reduce errors, and enhance customer satisfaction.

For example, in Kenya, small bakeries have adopted electronic ordering systems that have significantly improved their service delivery and customer satisfaction (Mwangi & Otieno, 2019). Such systems enable customers to place orders and make reservations remotely, ensuring that their requests are accurately recorded and processed (Kiconco & Namata, 2019).

Fiam Bakes, like many other small bakeries in Uganda, currently relies on manual processes to manage orders and reservations. This approach is time-consuming and prone to errors, leading to dissatisfied customers and operational inefficiencies (Nabirye, et al., 2016). By adopting an online Cake Ordering and Reservation Booking System, Fiam Bakes can improve its service delivery, reduce errors, and enhance customer satisfaction (Tumusiime, et al., 2018).

1.2 Problem Statement

In an era where advanced technology boosts work speed, reduces mistakes, and promotes accurate results, relying on a manual order and reservation system is a significant disadvantage. Traditional paper-based systems currently used by small bakeries like Fiam

Bakes in Masaka District are associated with problems such as order mix-ups, reservation conflicts, and inefficient record-keeping (Munusami, et al., 2018).

Many small businesses in Uganda, including Fiam Bakes, still manage their orders and reservations manually (Muriisa, 2014). This process is time-consuming and labor-intensive, leading to long turnaround times and customer dissatisfaction. Errors in order processing and reservation management can result in lost revenue and damaged reputation (Anon., 2018). Additionally, the costs associated with printing order forms and maintaining manual records are significant.

Therefore, an online Cake Ordering and Reservation Booking System that minimizes time, cost, and effort while maximizing accuracy and customer satisfaction was developed. This system ensures that orders and reservations are processed efficiently, reducing the likelihood of errors and improving overall service delivery.

1.3 Research Objectives

The research objectives of the study are categorized into major and specific objectives. The main objective describes the overall goal of the research, while specific objectives outline the steps taken to achieve this goal.

1.3.1 Main Objective:

- To develop an online Cake Ordering and Reservation Booking System for Fiam Bakes to improve order accuracy, efficiency, and customer satisfaction.

1.3.2 Specific Objectives:

1. To identify the challenges faced by Fiam Bakes in managing orders and reservations manually.

2. To design a user-friendly interface for customers to place orders and make reservations online.

3. To develop a database management system to efficiently store and manage order and reservation data.

4. To implement security measures to protect customer data and ensure system reliability.

5. To evaluate the performance of the online system in improving order accuracy and customer satisfaction.

1.4 Scope of the Project

This section describes the time scope, geographical scope, and functionality scope within which the researcher will carry out the study.

1.4.1 Time Scope

The process of developing the system started from proposal writing to system testing and validation done within a time frame of 6 months, from February 2024 to July 2024.

1.4.2 Geographical Scope

The system was developed to help in the order and reservation process at Fiam Bakes in Masaka District, Uganda. Fiam Bakes is a small bakery located in Masaka City, about 119 kilometers by road south-west of Kampala.

1.4.3 Functionality Scope

The system will be able to register customers, manage cake orders, and handle reservations. The system will also meet the following requirements:

a) User-Friendly Interface: Customers can easily navigate and use the system to place orders and make reservations.

b) Order Management: Efficiently handle and track orders from placement to fulfillment.

c) Reservation Management: Enable customers to book reservations for special occasions and ensure availability.

d) Customer Authentication: Only registered and verified customers can place orders and make reservations.

e) Order Accuracy: Ensure orders are accurately processed and details are correctly recorded.

f) Security: Protect customer data and ensure the system is secure from unauthorized access.

g) Accessibility: The system can be accessed by customers from any location using secure internet and mobile devices.

h) Multi-user Capability: Multiple customers can place orders and make reservations simultaneously.

1.5 Significance of the Study

Efficient order and reservation management is fundamental to the success of any small business, including bakeries like Fiam Bakes (Okediran, et al., 2012). A well-designed cake ordering and reservation system must provide several features, including accuracy and reliability.

Online ordering systems can potentially reduce or remove unwanted human errors. In addition to their reliability, these systems can handle multiple orders simultaneously and provide better scalability as the business grows. Online systems are also excellent mechanisms that do not require the geographical proximity of the customers (Anand & Divya, 2012).

Hence, an Online Cake Ordering and Reservation Booking System will improve efficiency and effectiveness in the process of ordering and reservation management as it will provide predefined functions that will enable users to perform all functions with much ease in the shortest time possible, thereby reducing the workload.

The system will help in speeding up the ordering process by reducing the time spent on managing orders and reservations manually. This will save Fiam Bakes' administrators time and resources and enhance customer satisfaction. Customers will benefit from the convenience of placing orders and making reservations from any location, at any time.

The researcher will promote the use of technology in small businesses in Masaka District. This, in turn, will help in improving the image of the country as a technology-driven nation. The researcher has gained knowledge in carrying out research on ordering and reservation systems and information systems in general.

1.6 Conclusion

The project focused on the development of an online Cake Ordering and Reservation Booking System which can be adopted by small bakeries like Fiam Bakes. The project aimed at solving the problems associated with manual order and reservation management to make the process faster, more secure, and reliable.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature relevant to the development of a Cake Ordering and Reservation Booking System for Fiam Bakes, focusing on Uganda, specifically Masaka District. The literature was sourced from various scholars who have published works related to the main and specific objectives of this research. This chapter discusses different aspects of online ordering and reservation systems, their functionalities, methods to achieve efficient and effective online booking, the challenges associated with such systems, and emerging technologies aimed at addressing these challenges.

2.1 Online Ordering and Reservation Systems

Online ordering and reservation systems refer to the use of the Internet to place orders and make reservations. These systems can take various forms depending on whether they are used in controlled environments (e.g., in-store kiosks) or uncontrolled environments (e.g., home internet) (Aceproject.org, n.d.). According to Stenbro (2013), an online ordering system (OOS) encompasses several types of services that use electronic means to facilitate placing orders and making reservations through a web system.

Online ordering leverages the Internet, SMS, or other digital services to facilitate transactions. For instance, many bakeries and restaurants now allow customers to place orders and book reservations online, which can significantly increase customer convenience and business efficiency. Estonia, for example, has successfully implemented digital services across various sectors, demonstrating the potential benefits of such systems (Participedia.net, 2018).

2.2 Categories of Online Ordering and Reservation Systems

Web-based Ordering Systems: These systems allow customers to place orders through a website. They provide a user-friendly interface where customers can browse products, place orders, and make payments securely. This system is widely used in various sectors, including retail and food services.

Mobile App Ordering Systems: With the increasing use of smartphones, many businesses offer mobile apps for ordering and reservations. These apps provide additional convenience, allowing customers to place orders and make reservations from their mobile devices.

Third-Party Platforms: Some businesses use third-party platforms to manage their online orders and reservations. These platforms, such as UberEats or OpenTable, offer a ready-made solution and can help businesses reach a wider audience.

2.3 Existing Systems

In recent years, several bakeries and restaurants have developed online ordering and reservation systems to streamline their operations.

2.3.1 Baker's Delight Online Ordering System

According to Bongomin (2017), Baker's Delight implemented an online ordering system where customers can browse the menu, place orders, and make payments online. The system tallies orders automatically and sends notifications to the bakery staff for preparation. However, the system has faced challenges related to user-friendliness and accessibility.

2.3.2 Sweet Treats Reservation System

According to Daily Monitor (2012), Sweet Treats developed a reservation system that allows customers to book tables and order cakes in advance. The system is web-based and accessible from multiple devices, but it is limited to reservations and does not integrate with the bakery's inventory management system.

2.3.3 Cake Click

According to Jones et al. (2012), CakeClick is an online ordering platform that provides multi-language support and uses secure payment gateways to facilitate transactions. Customers can order cakes, choose delivery options, and make payments online. The system is robust but lacks features such as real-time order tracking and customer feedback integration.

2.3.4 Delightful Desserts

Delightful Desserts offers an online ordering and reservation system that includes features like touch screen interfaces, customer reviews, and loyalty programs (Feldman et al., 2013). However, the system has been criticized for its complex user interface and high maintenance costs.

2.4 Benefits of Online Ordering and Reservation Systems

Accessibility

The online ordering system would help all customers gain usage regardless of where they are located. According to Habibu et al. (2017), with the surge of mobile devices, online ordering is a convenient option for many customers, allowing them to place orders anytime, anywhere.

Accuracy

Since online ordering utilizes automated processes, there are no misplaced or incorrect orders, and results are automatically tallied, eliminating the need for manual tabulation or corrections. Furthermore, according to Thakur et al. (2014), placing and processing orders becomes faster and more accurate with electronic systems, by default there are no invalid or unclear orders, and the automatic gathering and counting of orders reduce the amount of time spent processing and delivering results.

Faster Publication

With reduced costs in procuring materials and faster processing of orders by the database management system, results are published easily and quickly at the click of a button. According to Kamlakar (2012), when efforts are geared towards the minimization, if not the total elimination, of the problems associated with manual processing, faster dissemination of results is guaranteed.

2.5 Online Ordering and Reservation System Vulnerabilities

Some of these include the following:

2.5.1 Hacking

According to Chiang (2014), penetration of the ordering system would have serious ramifications, both for public confidence in online ordering and possibly in the business process itself. Penetration of the system need not take place during the ordering period but potentially any time prior to or after the event. Large amounts of potentially sensitive personal information may be divulged.

2.5.2 Spoofing

Spoofing is the act of disguising a communication from an unknown source as being from a known, trusted source. Spoofing can apply to emails, phone calls, and websites, or can be more technical, such as a computer spoofing an IP address, Address Resolution Protocol (ARP), or Domain Name System (DNS) server (forcepoint.com, 2019). Spoofing can lead to order theft and privacy compromise.

2.5.3 Trojan Horse

A Trojan horse, or Trojan, is any malware that misleads users about its true intent. Trojan horse attacks on PCs can change orders or spy on them (Anon., 2015).

2.5.4 Denial of Service Attacks

If a hacker could overload the ordering web server and prevent customers from placing orders, the integrity and meaningfulness of the ordering system would be compromised. Such attacks, where legitimate users are prevented from using the system by malicious activity, are known as denial of service attacks. A malicious attack or mass unintentional misuse may also cause servers to become unavailable, either temporarily or in the worst case for the duration of the ordering period. The client may be denied service by an attack on the delivery channel (Regjeringen.no, 2019). It is also possible that a client device is attacked using a program to initiate a large number of redundant computations, which could render the device useless.

2.5.5 Repudiation of Transaction

According to Shaikh & Borde (2011), an attacker could potentially go to the media and claim "I did not place that order!" This could be used in an attempt to undermine online ordering; how credible such a claim would be is questionable.

2.6 Implementing Security for Online Ordering and Reservation Systems

Security control distills the threat, assets, environmental assumptions, and security principles into a set of control intents that, if they are all met, ensure that the threats identified above are properly countered in the declared environment.

2.6.1 Effective User Registration

Ordering permission is only granted to those whose account IDs have been established. According to Shaikh & Borde (2011), a combination of procedural and technical measures ensures that users are properly identified before being granted permission to place orders and that multiple and false identities cannot be registered. The online ordering system in this research allows for the registration of users prior to each order through creating or importing customer data and assigning unique identity numbers (IDs).

2.6.2 Effective User Authenticity

Online ordering services are only available to those eligible to place orders. Access to online ordering services can only be obtained on the presentation of properly constructed access credentials (Bederson et al., 2003). Effective user authentication in this electronic ordering system was achieved through enacting an authentication policy where each user provided with a unique ID would confirm an account by creating temporary credentials and then using those credentials for authentication.

2.6.3 Effective Order Confidentiality

Online ordering services must guarantee the confidentiality of the order. According to Bederson et al. (2003), a combination of technical, procedural, and out-of-band measures would be employed to ensure that orders cannot be attributed to an individual during the ordering process.

2.6.4 Effective System Identification and Authentication

Accountable online ordering service processes are only accessible to those individuals and systems that have been authorized to access such processes (Chiang, 2014).

2.6.5 Effective System Registration

According to Worldcat.org (2008), access permission to e-ordering service processes is only granted to those whose accounts have been established. In this project, the researcher combines technical and procedural measures to ensure that users are properly identified and authenticated and can access only those parts of the system and assets necessary to perform the authorized tasks.

2.6.6 Effective System Access Control

According to Shaikh & Borde (2011), access granted to e-ordering service applications and assets is the minimum necessary for the identified user to obtain services required. In this project, the researcher creates views that map onto a requirement to ensure that a user or administrator, once identified by a relevant session and authenticated, would access only those parts of the system and assets necessary to perform the authorized task.

2.7 Conclusion

The major aim of reviewing literature was to gain a better understanding of the research that was carried out and ensure that the literature aligns with the research objectives. From the literature, it was discovered that there is still a need to improve

CHAPTER THREE

METHODOLOGY

This chapter outlines the methods, procedures, tools, and techniques used to conduct the project on developing a Cake Ordering and Reservation Booking System for Fiam Bakes, focusing on Uganda, specifically Masaka District. The data collection approaches, sources of data collected, data analysis techniques, and tools used for designing the system are discussed in depth.

3.0 Research Design and System Development Methodology

The research design describes the nature and pattern the researcher followed while collecting data in the study area. The researcher used the case study design, which consisted of detailed information obtained from the targeted population (customers and staff). The study focused on a survey involving descriptive, correlation, and cross-sectional research designs.

During project development, prototyping was used as the system development model. Prototyping involved the users and researcher interacting from the point of system planning up to when the new system was implemented and satisfied the user's needs as specified. The planning phase, analysis, design, and implementation were accomplished concurrently, resulting in a system prototype that was reviewed by the project researcher as shown in

Figure 1 Prototyping Model
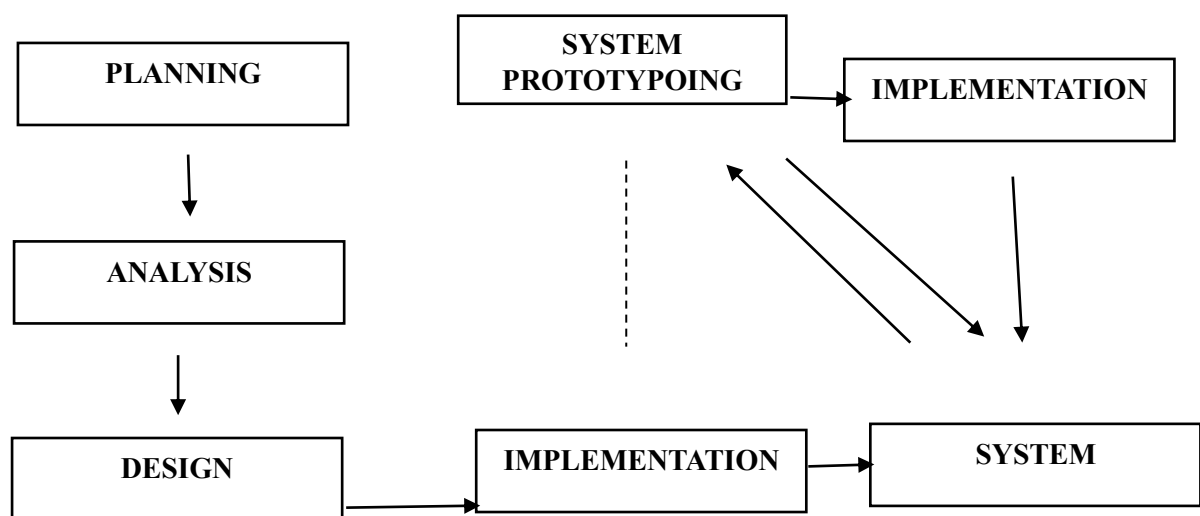
Figure 2: The Prototyping Model
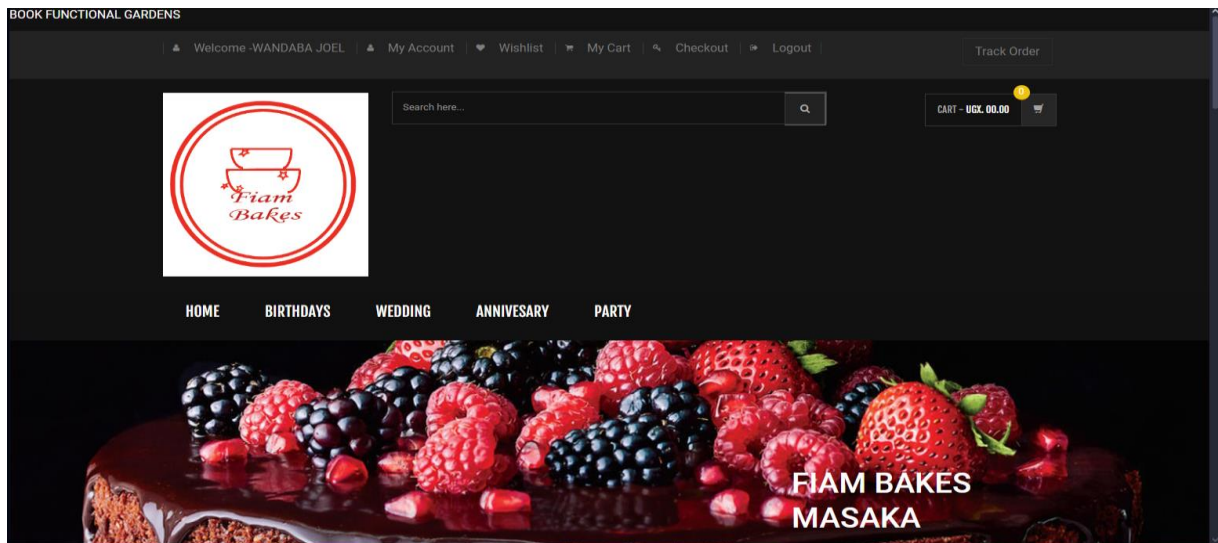
3.1 Study Area

The study was conducted in Masaka District, Uganda, focusing on Fiam Bakes. The researcher found that the idea of having an online cake ordering and reservation system was supported by the customers and staff of Fiam Bakes.

3.2 Target Population

This refers to the collection of elements, people, among others that can be used to investigate a particular fact or situation. Fiam Bakes has 3 administrators, 10 staff members, and an estimated 200 customers.

3.3 Sample Size

The sample size was calculated scientifically using Slovin's formula. This formula was used because it's a random sampling technique formula. The Slovin's Formula is given as follows:

$n = N$

$1 + N$

$e\,2$

n= 1+Ne

2

N

where

n is the sample size,

N is the population size, and;

e is the degree of freedom, which is equal to 0.05 given a 95% confidence interval.

Table 1 Showing sample size

Population Category	Category Size (N)	Sample Size (n)
Administrators	3	3
Staff	10	8
Customers	200	120
Total	213	131

3.4 Sampling Strategy

The sampling strategy used to sample some of the customers, staff, and administrators was simple random sampling. Simple random sampling is the basic sampling technique where a group of subjects (a sample) is selected for study from a larger group (a population). Each individual is chosen entirely by chance, and each member of the population has an equal chance of being included in the sample (stat.yale.edu, n.d.). Simple random sampling was used to select customers because they were too many.

3.5 Data Collection Methods

Data collection explained the process of gathering and measuring information on targeted variables in an established systematic fashion, which enabled one to answer relevant questions and evaluate outcomes. Data about the cake ordering and reservation system was collected using various methods such as interviews with the staff, customers, and administrators as respondents. These methods are discussed in greater depth below:

3.5.1 Interview Method

Using interviews, the researcher acquired relevant first-class information from the staff, customers, and administrators of Fiam Bakes. This method involved face-to-face interaction with the respondents. The interviewer compiled questions for the targeted users, which helped get the specific requirements to include during the development of the system. This enabled the researcher to interact with the administrators of Fiam Bakes and get information about the existing system and knowledge about how the system operates.

3.5.2 Questionnaire Method

Questionnaires were used to gather information from individuals within the scope of the study and to secure answers to questions using a form filled in by the respondents. This method involved a number of related questions based on the study objectives of the project. These questions were given to the respective respondents, who were required to fill them in accordingly.

3.5.3 Observation Method

Observation was also a data collection method used by the researcher. This involved personal appearance, where the researcher participated in the cake ordering and reservation process at Fiam Bakes, which helped him to focus on what was wanted. This method helped the researcher to acquire all the required information conveniently and flexibly.

3.6 Design Phase

Information gathered during the analysis phase was used to formulate models that represented the solution of the system.

3.6.1 Modeling

Visual paradigm: Microsoft Visio was used as a modeling tool to come up with a conceptual framework/Entity Relationship Diagrams.

Unified Modeling Language (UML): UML is a general-purpose modeling language in the field of software engineering, designed to provide a standard way to visualize the design of a system. UML was used to create process diagrams and context diagrams.

Data Flow Diagrams (DFD): DFDs were used to map out the flow of information for processes or systems. Symbols used included rectangles, circles, and arrows, along with short text labels, to show data inputs, outputs, storage points, and routes between each destination.

Entity Relationship Diagram (ERD): ERDs were used to show the relationships of entity sets stored in a database. An entity in this context was a component of data used to illustrate the logical structure of databases.

3.7 Implementation Phase

3.7.1 Tools and Technologies for Implementing the System

PHP: PHP, an acronym for "PHP: Hypertext Preprocessor," is a scripting language originally designed for web development to produce dynamic web pages. It was used to design user interfaces.

HTML (Hypertext Markup Language): HTML is the predominant markup language for web pages, written in the form of HTML elements consisting of tags. It was used to create forms and tables.

XAMPP: XAMPP, which stands for Extensible Apache MySQL PHP, is a free software package developed by Apache Friends that includes Apache, MySQL, and PHP. It was used as a local host/server to develop and test the system. MySQL was used to design the database for the system, and pages were stored in the system's special folder known as the htdocs directory.

CSS: CSS is used to style web pages written in HTML and XHTML. CSS improves content accessibility, allows more pages to share formatting, and reduces complexity and repetition in the structural content. The researcher used CSS for the separation of document content from document presentation.

Bootstrap: Bootstrap was used to design the system quickly and make it easier for users. It helped the researcher to create the layouts of the system.

Browser (e.g., Google Chrome, Mozilla Firefox): A web browser is a software tool used to access a system that has been developed. The researcher used a web browser to access the system and allowed the researcher to enter the system's address to access and visit it.

3.8 Testing and Validation

The system was tested against user requirements and security. Individual modules were integrated into a complete working system, and then the whole system was tested and validated for efficiency, effectiveness, and reliability.

System Testing Techniques

Requirement Testing: The researcher ensured that the system performed correctly and that its correctness was sustained for a considerable period. The system was tested for correctness through all phases of SDLC.

Error-Handling Testing: Error handling testing determined the ability of system modules to process incorrect transactions properly.

Unit Testing: Unit testing is a level of software testing where individual units/components of software are tested. Individual unit components of the system were tested.

Integration Testing: Integration testing is a level of software testing where individual units are combined and tested as a group. The system was tested as a whole.

3.9 Conclusion

The development of an online cake ordering and reservation system involved many phases. The approach used was top-down, concentrating on what should be done first, then how, and moving to successive levels of details

The first phase started with a detailed study of the problems and prospects of ordering and reserving cakes using computers. During this study, many problems were discovered to have hindered the effectiveness of the existing manual system. These problems, information needs, and activities were documented and later used as the basis for system design, which immediately followed the first phase. The design phase was concerned primarily with the specification of the system elements in a manner that best met Fiam Bakes' needs.

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN

4.0 Introduction

This chapter presents findings from the questionnaires and interviews, explains the current cake ordering and reservation system used at Fiam Bakes in Masaka District, Uganda, and addresses the problems of the current system. It then proposes a new solution. The chapter describes the user requirements for the system, identifies the functional requirements, and lists the non-functional requirements. Additionally, it explains the database design, interface design, program modules, and hardware requirements.

4.1 Analysis of Data

Data from 195 respondents at Fiam Bakes in Masaka District was analyzed. The data was collected from customers, staff, and administrators using questionnaires and interview guides. The respondents were asked about the level of their ICT skills. The results are indicated in Table 4.1 below:

4.1.1 Respondent's ICT Skills Level

Table 2 Respondents' ICT Skill Levels

ICT Skill Level	Customers (200)	Staff (10)	Administrators (3)	Total (213)
Basic	120	10	3	133
Intermediate	60	9	3	72
Advanced	50	8	3	61

4.2 Current System Analysis

As of the time of this research, FIAM Bakes Masaka was still relying on manual, paper-based procedures for cake ordering and reservation booking. Customers would typically visit the

bakery in person or call to place orders and make reservations. Here is a detailed description of the current system:

Order Placement: Customers visit the bakery or call to place their orders. They provide details such as the type of cake, size, flavors, special requests, and the desired pickup or delivery date and time. These details are recorded manually by the staff on paper forms or in notebooks.

Reservation Booking: For special events like birthdays, weddings, or corporate functions, customers can book reservations for cakes. Similar to the order placement process, these reservations are made by visiting the bakery or calling. The details are recorded manually.

Confirmation: After recording the order or reservation details, the staff manually checks the availability of the requested cakes and dates. Once confirmed, the staff contacts the customer to confirm the order or reservation. This confirmation is also done manually and noted on paper.

Preparation and Fulfillment: The bakery staff uses the manually recorded details to prepare the cakes. All the information regarding the orders and reservations is accessed from the paper records. There is a high risk of errors in this manual process, such as incorrect cake details, wrong pickup or delivery times, and missed orders.

Payment: Payments are made in person when customers pick up their cakes or when the cakes are delivered. Payment details are recorded manually.

Tracking and Reporting: There is no efficient way to track orders and reservations or generate reports. Staff must manually compile information from various paper records, which is time-consuming and prone to errors.

Entity-Relationship Diagram (ERD)

Below is the Entity-Relationship Diagram (ERD) for the Cake Ordering and Reservation Booking System for FIAM Bakes:
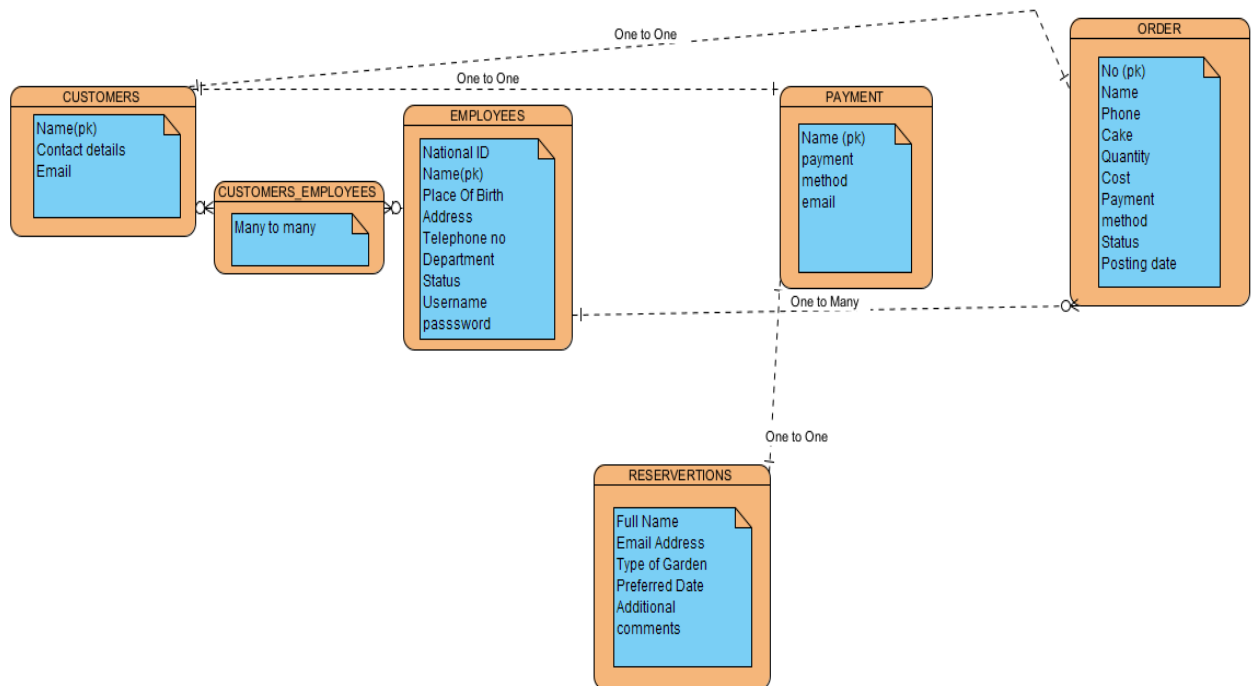

Figure 3: Entity-Relationship Diagram (ERD)

Description of ERD Components

Customers: This entity stores information about the customers who place orders or make reservations. Key attributes include Name, ContactDetails, and Email.

Employees: This entity stores information about the bakery staff who handle the orders and reservations. Key attributes include National ID, Name, Position, and Email.

Orders: This entity captures the details of cake orders placed by customers. Key attributes include OrderID, No (foreign key referencing Customers), EmployeeID (foreign key referencing Employees), CakeType, Flavor, Size, SpecialRequest, PickupDate, and PickupTime.

Payments: This entity records payment information for orders. Key attributes include PaymentID, OrderID (foreign key referencing Orders), Amount, and Date.

Reservations: This entity records details of special event reservations. Key attributes include ReservationID, OrderID (foreign key referencing Orders), EventType, EventDate, and EventTime.

4.2.1 Existing System at Fiam Bakes

The current cake ordering and reservation system at Fiam Bakes is primarily manual. Orders are placed via phone calls or in-person visits, and reservations are recorded manually in a ledger book. This system has several drawbacks:

Time-Consuming: Manual entries take time and may delay order processing.

Prone to Errors: Manual recording can lead to mistakes in orders and reservations.

Limited Accessibility: Customers must physically visit or call during working hours.

Inefficient Record-Keeping: Manual records are difficult to manage and retrieve.

4.3 Proposed System

To address the limitations of the current system, a new online cake ordering and reservation booking system is proposed. This system aims to automate and streamline the ordering and reservation process, making it more efficient and accessible.

4.4 User Requirements

4.4.1 Functional Requirements

User Registration and Login: Customers should be able to create accounts and log in.

Order Placement: Customers should be able to browse cakes and place orders online.

Reservation Booking: Customers should be able to book reservations for special events.

Order Tracking: Customers should be able to track the status of their orders.

Payment Processing: The system should support online payment options.

Administration Dashboard: Administrators should manage orders, reservations, and customer data.

4.4.2 Non-Functional Requirements

Security: The system must ensure data security and privacy.

Usability: The system should be user-friendly and easy to navigate.

Scalability: The system should handle an increasing number of users and transactions.

Reliability: The system should be reliable and have minimal downtime.

Performance: The system should respond quickly to user requests.

4.5 System Design

4.5.1 Database Design

The database design includes the following tables:

Users: Stores user information (e.g., user_id, username, password, contact information).

Cakes: Stores cake details (e.g., cake_id, name, description, price, image).

Orders: Stores order information (e.g., order_id, user_id, cake_id, quantity, total_price, order_date).

Reservations: Stores reservation details (e.g., reservation_id, user_id, event_date, Type of gardens, Additional comments).

Payments: Stores payment information (e.g., payment_option, order_id, user_id, payment_date, amount, payment_method).

4.5.2 Interface Design

The interface design includes:

Home Page: Displays a welcome message and featured cakes.

User Dashboard: Allows users to view their orders and reservations.

Order Page: Allows users to browse and order cakes.

Reservation Page: Allows users to book reservations for events.

Admin Dashboard: Allows administrators to manage orders, reservations, and customer data.

4.5.3 Program Modules

The system consists of the following modules:

- User Management: Handles user registration, login, and profile management.
- Order Management: Handles the placement and tracking of orders.
- Reservation Management: Handles the booking and management of reservations.
- Payment Processing: Integrates with payment gateways to process payments.
- Admin Management: Allows administrators to manage the system.

4.5.4 Hardware Requirements

The hardware requirements for implementing the system include:

- Web Server: To host the application.
- Database Server: To store the data.
- User Devices: Computers or mobile devices with internet access.

Table 3 Showing Hardware requirements

Hardware	Specification
Processor	2.5GHz
RAM	2.00GB
Windows Operating system	32/64 bit
PHONES	Smart phones.

4.6 Conclusion

This chapter outlined the findings from the analysis of the current system at Fiam Bakes and proposed a new online cake ordering and reservation booking system. The proposed system aims to address the limitations of the current manual system by providing a more efficient, secure, and user-friendly solution. The functional and non-functional requirements were identified, and the system's design, including the database, interface, program modules, and hardware requirements, were detailed.

CHAPTER FIVE

SYSTEM IMPLEMENTATION AND TESTING

5.0 Introduction

In this chapter, the researcher documents the implementation process of the earlier designs, both conceptual and logical, to form a working Cake Ordering and Reservation Booking System for FIAM Bakes, Masaka. This includes the implementation of the graphical user interface. During this phase, the actual coding was done, resulting in a feasible system.

5.1 Implementation Plan.

This section details the activities, deliverables, and tools used during the implementation of the system, as outlined in the table below.

Table 4: Implementation Plan.

ACTIVITY	DELIVERABLES	TOOLS
Coding	• Complete implementation of the system architecture • Link interface to database	PHP, JavaScript, HTML, MySQL, XAMPP server.
Testing plan	• Inspection of code for predictable errors. • Structured walkthrough. • Test correctness, performance, and reliability • User testing of the system • Security testing and authentication • Test results documentation.	Browser (opera min)
Documentation	• System documentation and key features	MS Word
Training plan	• User manuals CDs	MS Word

5.2 Database Implementation

The database was created using MySQL and run on a MySQL Server. The database and all defined components were designed and generated using MySQL Server. The tables and their constraints, such as primary keys, unique keys, foreign keys, and indices, were well defined. Primary keys were used to uniquely identify all records, while foreign keys ensured data integrity across related tables.
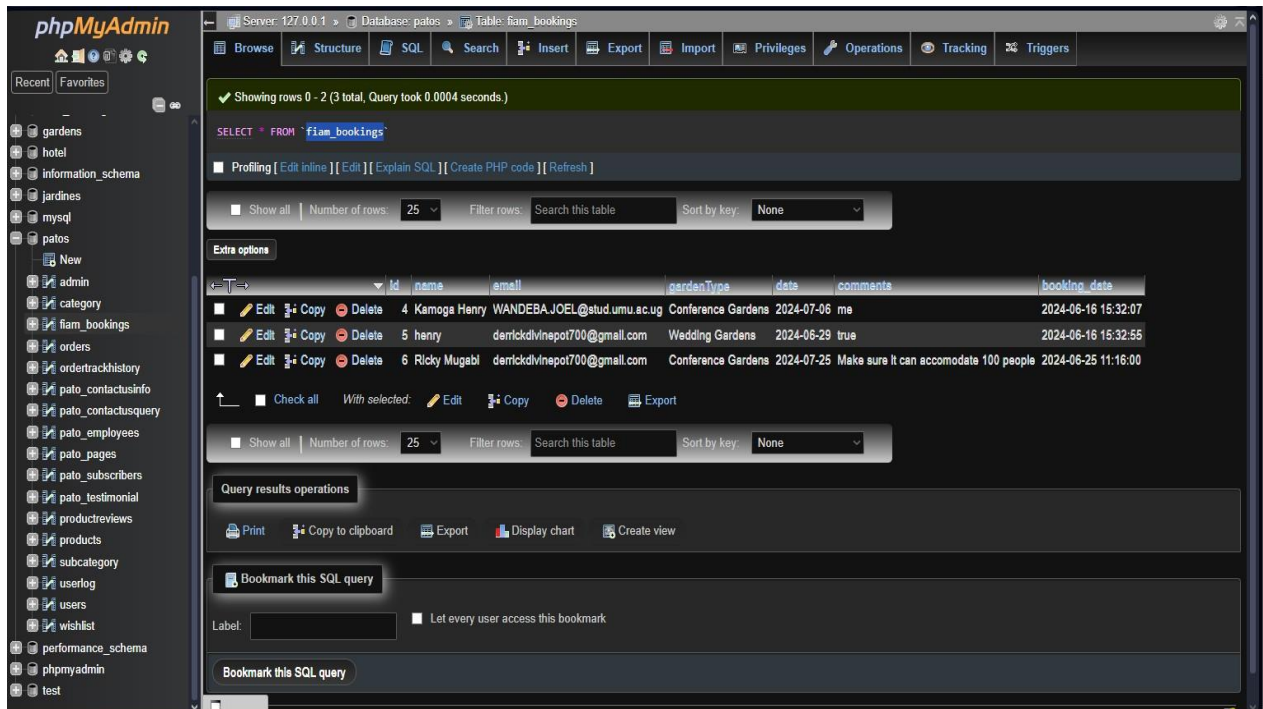

Figure 4: Screenshot of the database and database tables.

5.3 System Implementation

This section describes the implementation of user interfaces and test plans. During coding, the logical and physical design models and specifications were transformed into machine language.

5.4 User Interface Implementation

The system was developed as an interactive mechanism between the user interface and the database using a web browser. This enables a user to interact with the MySQL database through a web browser to enter, edit, view, and retrieve data according to the privileges granted.

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5.4.1 The Login Page

The login page provides access to the system for registered users. It is generated when the user clicks on the "Login" button. Users enter their username and password. Access levels and views are determined by the administrator's assignment of roles in the system.
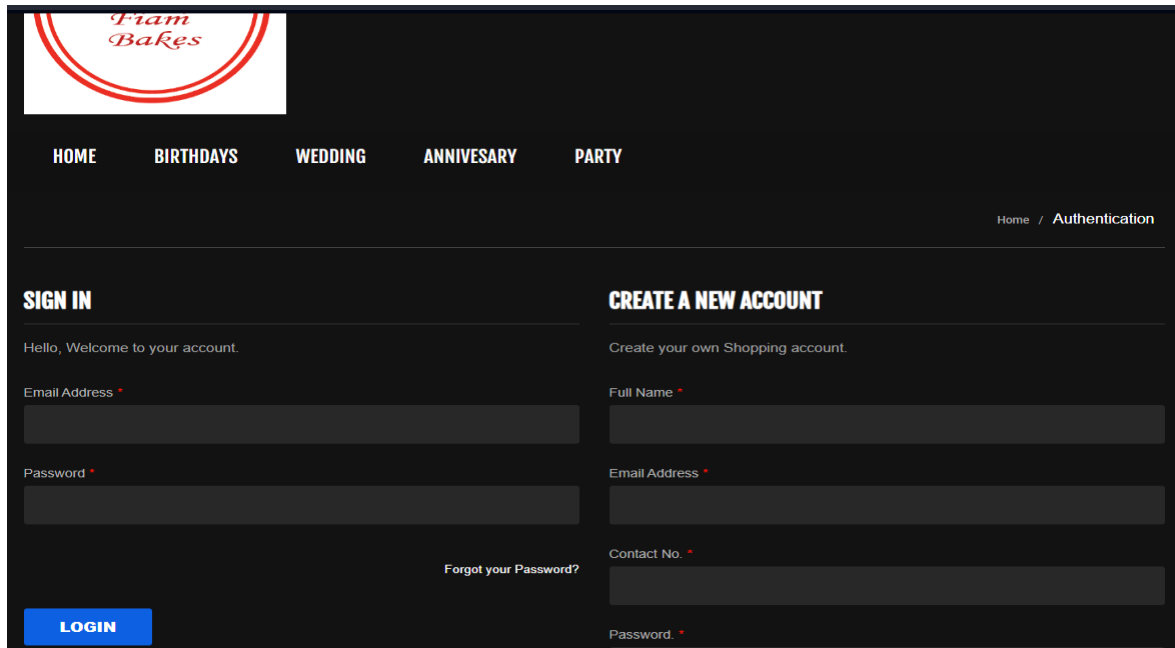

Figure 5: Screenshot of login page.

5.4.2 The Admin Home Page

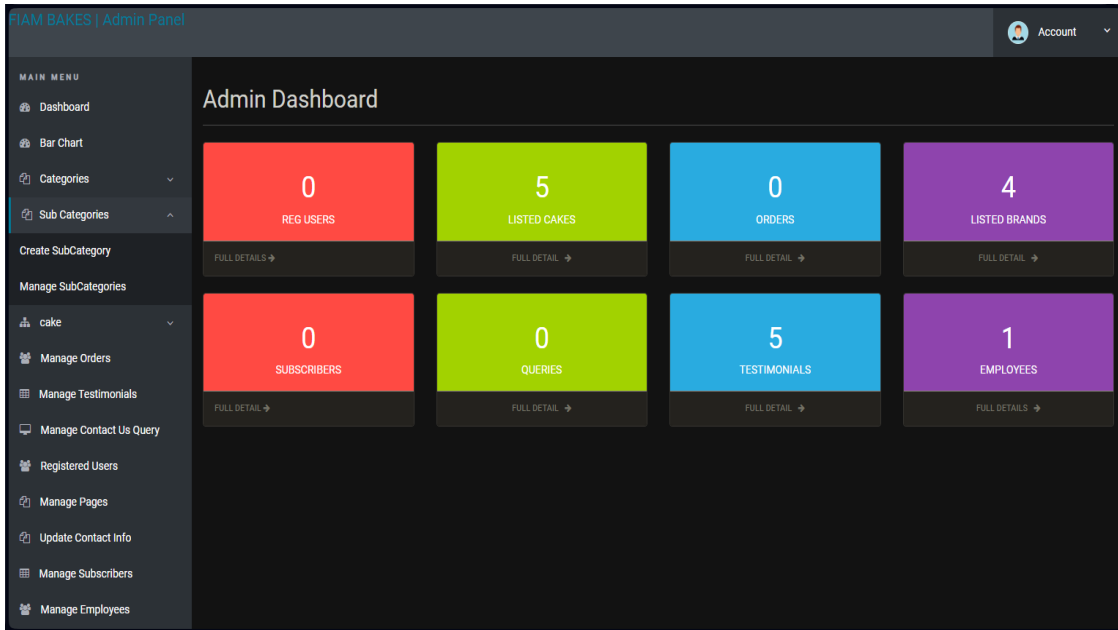This page is strictly reserved for the system administrator. Only the administrator has the privileges to access and use this page.

Figure 6: Screenshot of admin home page.

5.4.3 The Customer Order Form

This form is used by customers to place orders for cakes. Customers provide details such as cake type, quantity, preferred delivery date, and any additional comments.
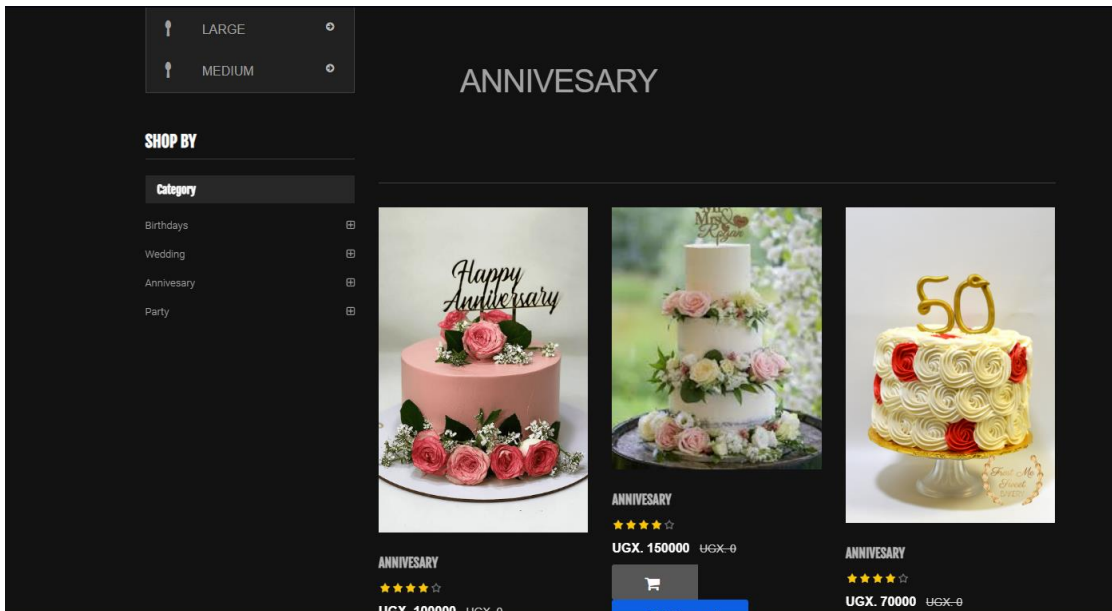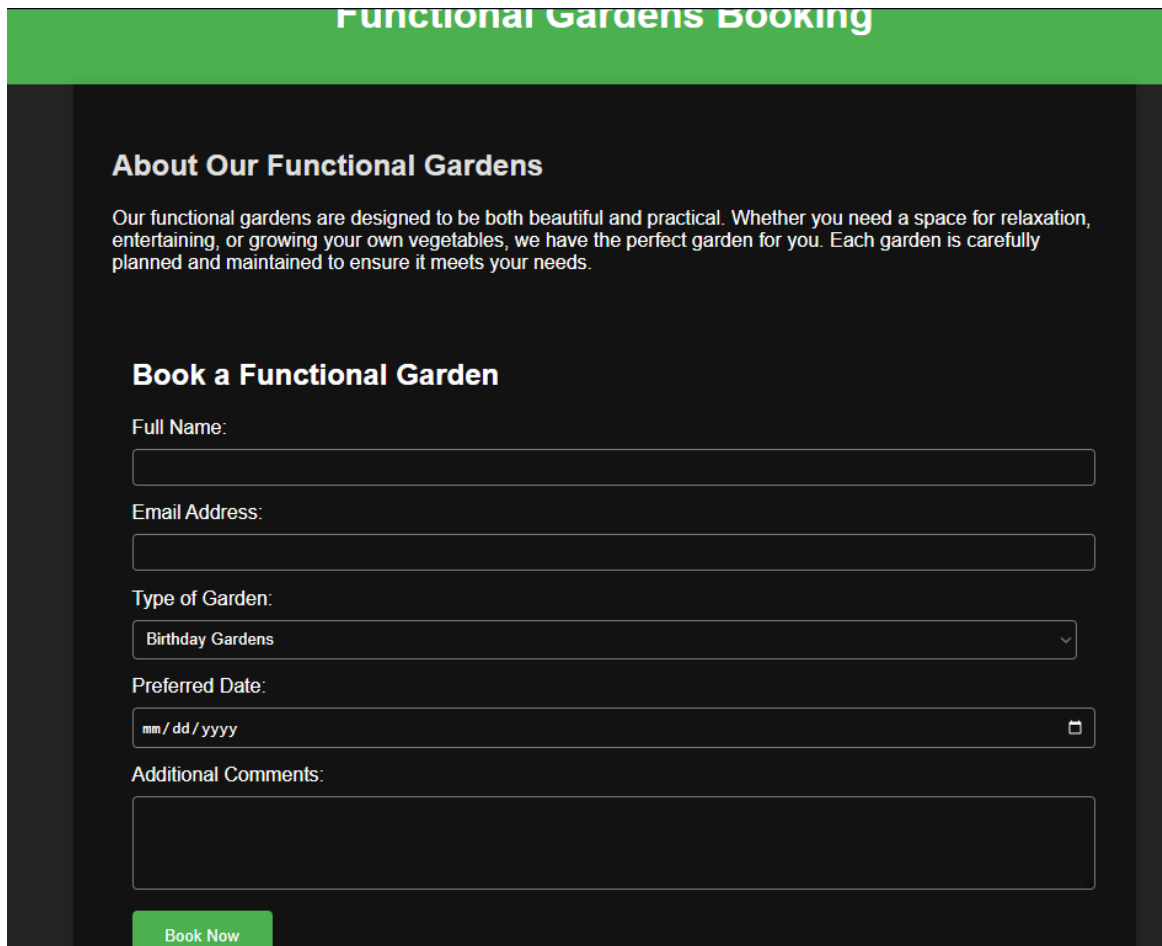

Figure 7: Screenshot of customer order page

5.4.4 The Reservation Form

This form allows customers to make reservations for special events like birthdays, weddings, and conferences. The form captures details such as event type, date, number of guests, and special requirements.

Figure 8: The reservation form

5.4.5 The Customer List

This page displays a list of customers who have registered with FIAM Bakes. These customers are the ones eligible to place orders and make reservations.
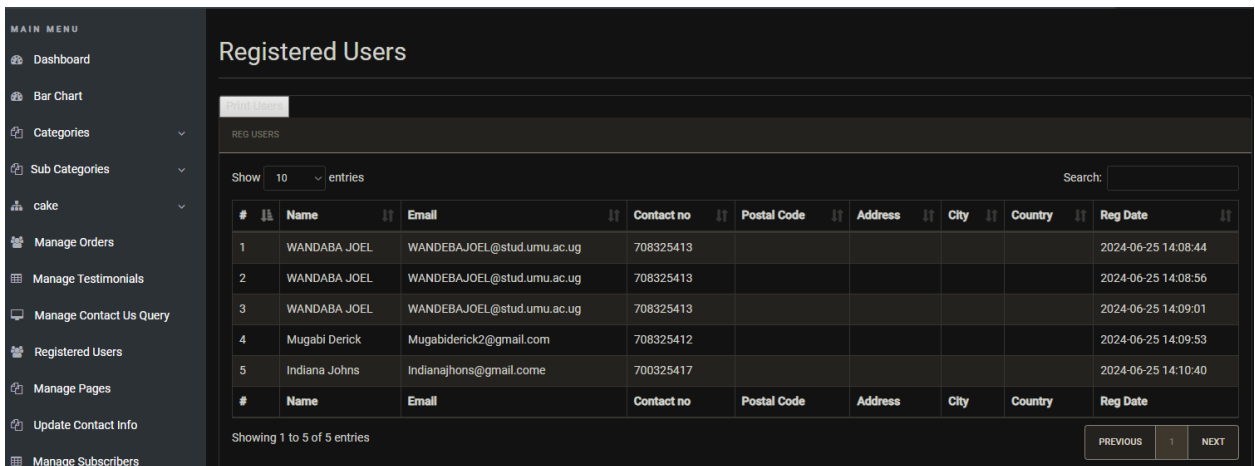
Figure 9: Screenshot of customer list page

5.4.6 The Order Management Page

This page allows the admin to view, edit, and manage orders placed by customers. It includes options to update order status, track deliveries, and handle customer inquiries.

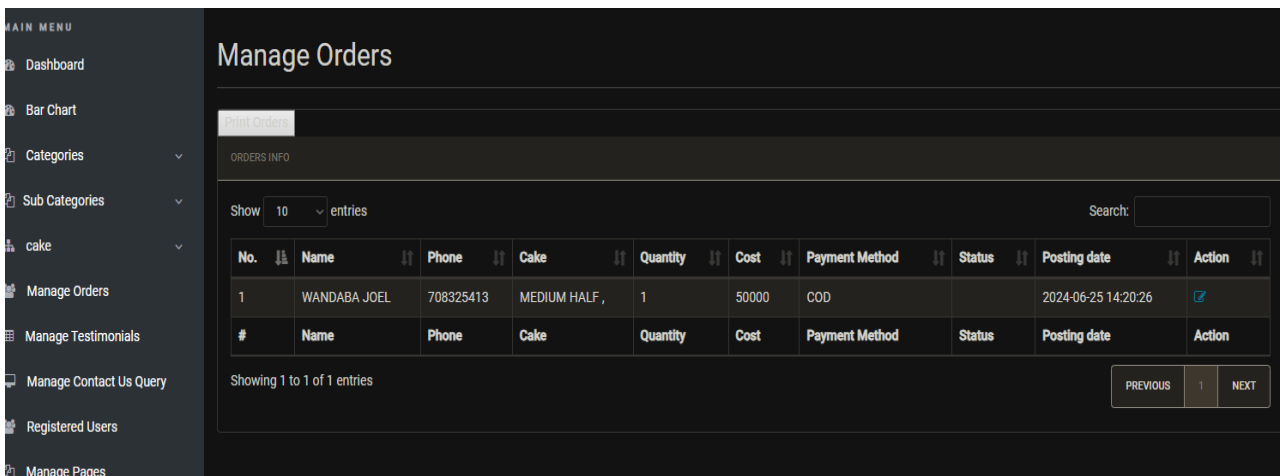**Figure 10: The order management page**

5.4.7 The Reservation Management Page

This page allows the admin to manage reservations made by customers. It displays reservation details and provides options to confirm, cancel, or modify reservations.

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Figure 11: The reservation management page

5.5 Testing and Validation

Testing involved executing system components to evaluate one or more properties of interest. These properties indicated the extent to which the component or system under test:

i. Meets the requirements that guided its design and development,

ii. Responds correctly to all kinds of inputs,

iii. Performs its functions within an acceptable time frame,

iv. Is sufficiently usable,

v. Can be installed and run in its intended environments,

vi. Achieves the general result desired by the case study.

5.5.1 Unit Testing

In unit testing, the researcher tested each script code line by line independently. This was done with the intention of executing each statement of the module at least once. Unit testing helped identify any errors in the program code.

5.5.2 Integration Testing

In integration testing, the researcher tested multiple modules working together. This was intended to find discrepancies between the system and its original objectives, current specifications, and documentation. Tested modules included the database module, user module, order management module, and reservation management module.

5.5.3 System Testing

System testing was conducted to check the system's functionality under different running environments such as Windows XP, 7, 8, 10, UNIX, and Linux. The researcher checked the functionality and correctness of the software according to specified user requirements to improve the quality and reliability of the system.

5.6 Conclusion

This chapter focused on the implementation of the system and the presentation of the final system design. The transition from design to a working system was detailed, along with the testing and validation processes that ensured the system's functionality, performance, and reliability.

CHAPTER SIX

DISCUSSION, CONCLUSION AND RECOMMENDATION

6.0 Introduction

This section presents the comparison of the project's findings. An overview of the project is given in this chapter, having gone through all the stages of information system planning, analysis, design, and implementation. A brief discussion is made to make recommendations and conclusions.

6.1 Summary

In the attempt to evaluate the designed system, it was imperative that the researcher look back at the predefined functionalities, goals, and objectives and analyze those in relation to the expectations met by the system. The Cake Ordering and Reservation Booking System was evaluated based on the set of predefined objectives and the expected functionalities it was able to fulfill. The Cake Ordering and Reservation Booking System was designed to facilitate efficient ordering and booking at FIAM Bakes Masaka by providing an efficient, reliable system and after a careful evaluation process; it met a considerable portion of those expectations.

The main objective was to develop an online cake ordering and reservation booking system for FIAM Bakes that minimizes the time, effort, and cost and maximizes security involved in the ordering and booking processes. As far as this is concerned, the system met this expectation by giving direct benefits to the business such as fast order retrieval. It also included functionalities that enable all data entrants to access the system online with the assumption that client-server architecture is in place, retrieve records on demand and execute important reports to support daily business tasks.

Fundamentally, the effectiveness of this project depended on meeting the project's specific objectives which were as follows:

To analyze the current cake ordering system to identify the gaps, challenges, and requirements necessary for developing an online cake ordering and reservation booking system which was done in chapter four during analysis of the current system.

As a result of collecting data and information about the current system, requirements for the new system were derived and design was done in chapter four. The implementation was then done in chapter five basing on the guidance got from chapters three and four.

Testing and validating the implemented system was done in chapter five during testing and validation so as to ensure that it functions properly and meets the user's requirements. All the objectives were met by the system, to a certain extent.

6.2 Challenges and Constraints Faced

Many challenges and constraints were met during the implementation of the project which included the following:

The system was developed and implemented concurrently with other course units the researcher had to accomplish. This led to implementation of the system in parts which were merged later due to time limitation. It could be better than it is if the researcher had got more time.

Understanding key concepts limitations also posed a major challenge. Considering the fact that most of the concepts were new, the researcher had to spend a considerable amount of time learning the concepts. This took away a lot of valuable time that would otherwise be fully dedicated to the design of the system.

The researcher was also met with a few financial constraints as a result of unanticipated expenditure. In order to cater for the slow internet speeds in the university computer labs, the researcher had to subscribe for a dial-up internet connection in order to proceed with the project unhindered. This expenditure was however unforeseen and therefore posed a challenge for the researcher.

6.3 Conclusion

In Conclusion, from a proper analysis and assessment of the developed system, it can be safely concluded that the system is an efficient, usable, and reliable online cake ordering and reservation booking system. It is working properly and adequately meets the minimum expectations that were set for it initially. The new system is expected to give benefits to FIAM Bakes Masaka in terms of increased overall productivity, performance, and efficient order and booking management.

6.4 Recommendation

Based on the results of the findings and conclusions gathered, the researcher would like to recommend the following:

i. Widening the scope: Given the limited amount of time given to the developer, the project's scope was rather limited to only cake ordering and booking at Masaka branch. The scope can further be widened to include all the other branches of FIAM Bakes to make a more integrated comprehensive system that covers the entire business.

ii. The researcher recommends the proposed system be deployed because it is more productive and more capable of fastening ordering and booking activities in the bakery.

iii. Future researchers should continue to improve the proposed system.

iv. The administrator should train employees in order to know how to use the system and dispatch. That is to say, employees of FIAM Bakes should also be trained on how the system works.

This revised chapter reflects the context of FIAM Bakes Masaka, focusing on the Cake Ordering and Reservation Booking System.

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