MAPISHI HODARI: A RESTAURANT AUTOMARED ORDERING,DELIVERY AND PAYMENT SYSTEM

Student ID: 102258

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DECLARATION AND APPROVAL

I Juma Valentine Mareva declare that this project has not been submitted to any other University for the award of a Degree in Business Information Technology.

Student: Sign: _____ Date: _____

Supervisor: Sign: _____ Date: _____

ABSTRACT

A good restaurant means one that provides great service, delicious food and amazing ambience. Everybody loves fast service when in a restaurant. The manual food ordering system hinders fast service because often there could be miscommunication between the waiters and customers.

Most restaurants in Kenya use the manual ordering system where the waiter approaches customers once they get into the restaurant and give them the menu and after the customers choose what they will eat and drink, the waiter goes back to the kitchen counter and places the order and when it is ready, food is brought by the waiter to customers. For payment, most restaurants use cash and Mpesa where the customers pay via paybill number of the restaurant and having less methods of payment is quite limiting.

The system to be created is an online ordering, delivery and payment system. Some of its advantages is that it will make the ordering process easier and it will enable the users to monitor their expenses and have their food delivered at the comfort of their homes. (REST LABS, 2017) The system will be a website-based system. This is because web-based systems have greater flexibility and scalability and are easier to integrate with other systems.

The methodology used will be the agile one because it is very convenient in that it provides ample time to design, construct and test the system. The system analysis used will be the Structured Systems Analysis and Design (SSAD) and the system design will be Structured-Systems Design (SSD).

I used notepad ++ to code and the language used to code is php. The system will allow the head of restaurant who will also be the admin, to add or delete items from menu and also to view the orders. The customers will be allowed to order from the system and also pay from the system with the payment option of their choice.

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LIST OF ABBREVIATIONS

KFC-Kentucky Fried Chicken

OOD-Object-Oriented Design

OOA-Object-Oriented Analysis

OOAD-Object-Oriented Analysis and Design

SSD-Structured-System Design

Chapter 1: Introduction

1.1Background

Many people in the society do work so hard and often get very exhausted. After getting worn out from work it is surely good to take a break and cool off and also re-energize before getting

back to the hectic work schedule again. One good way to relax and carry out fun activities is by acquiring a membership from a sports club of one's choice where one would go either alone or with the family to carry out sporting activities or even to get a wellcooked meal and drinks from a restaurant and just relax and cool off.

A club is an organization offering members social amenities, meals, and temporary residence or even a group of people or nations having something in common. (OXFORD)Clubs offer a variety of recreational services to their members such as golf facilities, swimming pool, basketball, football facilities and also dining facilities to their members and their guests. Clubs also frequently host special events such as weddings. In order to acquire the benefits given in clubs, one has to have applied for membership. Once one has acquired membership they can come and get services from the club. The main focus of the project is the dining section of sports clubs and also restaurants.

When members dine in various sports clubs or restaurants they use various methods of payments. Various sports clubs and restaurants use various methods of payments for services given by the club. A lot of sports clubs collect payment using cheque or cash. Collecting your payments by cheque or credit card can be fairly time consuming and frustrating. (GOCARDLESS, 2017)

For most of the sports clubs and restaurants in Kenya, payment is made through cash when the member pays immediately after services are provided or end month for members only when total expenditure on meals in the club by the member is identified and deducted directly from salary. Most members use the second option where the total expenditure is deducted from the salary. The problem with this current system is that the members total expenditure from receipts may not match the total expenditure displayed by the restaurant or club hence the need of my application that would be able correct that. This is because it would keep track of the member's expenditure therefore keeping them aware of how much they are using or have used in total per month.

1.2 Problem Statement

Manual ordering systems put pressure on people to be correct in all details of their work at all time and the problem is that people are not perfect. (Breitmeyer, 2015) The waiters could often make errors because of a large number of customers that they are dealing with. Most

customers get infuriated when their orders get confused or when the waiters take long to serve them.

The manual ordering system is also time consuming because the customer should wait for the waiter to take his order to the kitchen first and later on get the food and bring it to them when it is ready. The proposed system intends to do away with that.

When it comes to payment for the food and drinks, most restaurants in Kenya use the cash method or mobile money (m-pesa).Cash, which is the commonly used forms of payment in restaurants and sports clubs is said to be fairly time consuming and frustrating. (GOCARDLESS,2017).

Many are times when customers want to order food and receive it at the comfort of their homes. For those customers with memberships in restaurants and sports clubs, the problem comes in when the members are presented with receipts and the payment is made at the end of the month. This becomes an issue when the members would lose a couple receipts in one way or another and fail to track their expenditure on meals in the sports club. The system I intend to make would allow the members to keep track of their expenditure and will also allow them to pay for their food and drinks with the payment method of their choice.

1.3 Aim

The main aim is to develop an application to aid in making the ordering of food and payment by the restaurant customers easy. The application will enable the customers to have theirFor those who wish to pay at the end of the month, my app will enable them to keep track of their expenditure in the sports club such that at the end of the month, what reflects on their end matches with that which the sports club is displaying.

1.4 Specific Objectives

i. To critique current technique of food ordering and payments.
ii. To collect data about payment systems.
iii. To develop a website application that will facilitate ordering, payment and accountability.
iv. To test the application.

1.5 Justification

I believe this project is important because it will help the members of the sports clubs and restaurants to be accountable of their expenditure. I t will keep them in check in terms of spending. I f one notices they have spent quite a lot that month , they could slow down for example by visiting the restaurant less often. A part from that, the application will also give them the freedom to order food and drinks by the click of a button and also use a preferable choice of payment that personally suits them.

1.6 Scope and Limitations

1.6.1 Scope

The aim of this project is to create a website application that will enable the customers to order food with prices of each food and drinks indicated in the application and also allow them to make payment either at that moment or end of month. This way the application will keep track of the food ordered and money spent by the members on food and drinks in every visit to the club or restaurant. The assumption in this project is that most members are always given receipts that show the expenditure in every visit to the club. The system I will develop will enable the head of restaurant to delete the expenditure of the members after a month.

1.6.2 Limitation

The limitation of this project is that I intend to incorporate a wide variety of payment methods in the website application to be able to accommodate the various preferences of various customers using the application.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews the existing literature on the available food ordering and payment systems around the world, the trends in mobile technology and how the food industries have adopted mobile technology in regards to ordering and payment. It first starts by looking into those challenges or problems that exist in the current food ordering and payment systems.

2.2 A description of current payment and ordering process

Most if not all restaurants and sports clubs in Kenya use the same ordering process and payment process. Once a customer arrives at a place to eat, they either find a menu on their table or a waiter brings them the menu. The customer is then given time to look at the menu and decide what food and drinks they would take. The waiter comes and takes the order from the customer and goes back to the kitchen or the counter to give the order to those responsible. When the customer's food is ready, the waiter brings to them the food and afterwards after the customer is done, they either give the waiter the payment or go forward to the counter and give the payment to the cashier depending on how the restaurant or sports clubs operates. This current system is known as manual food ordering system. During peak hour, customers may be too many to be served by waiters. The quality of the service may drop thus causing dissatisfactory of customers. However, if there are too many waiters are hired, it may be a waste of resources during non-peak hour. (Sainath Reddy K*, 2016)

Some restaurants on the other hand prefer reservations other than 'open table' which is a much hated term in the restaurant business, refers to an empty seat in the dining room. (Articles, In-Depth, 2018). From the article, it states that restaurants hate open tables because it counts as losses as they paid for rent, utilities and electricity. In order to help reduce the number of open tables in a restaurant and maximize table turnover, and to limit the waiting time for paying customers, restaurants began taking reservations. (Articles, In-Depth,2018).

Various forms of payment are used in restaurants and sports clubs. Many years back cash was commonly used but things are no longer the same today. According to a U.S. Bank survey, 50% of people say they carry cash with them less than half the time and when they do, 76% report keeping less than $50. (Dana, 2010). Because of this, it's become more important than ever to accept a variety of payment types - the ones your customers are relying on most. Because a good percentage of people don't carry cash around, other methods of payments such as debit cards or credit cards could be used and even m-pesa here in Kenya. (Moneris, 2010)

2.2.1 Challenges experienced with current food ordering and payment systems

There are various challenges with the current food ordering and payment system. With the current ordering system in Kenya, the challenge comes in where it is mandatory for the waiter to come and take the customers' order first and later on take it to the kitchen to inform the ones making the food so that they give the food to the waiters so as to bring it to the customers. This is a problem because it is indeed time consuming. With the payment system, most restaurants and sports clubs in Kenya mostly use cash but others have incorporated m-pesa too. There is not much a variety of forms of payment in all restaurants and sports clubs and that is quite limiting because; various people use various methods of payment.

Figure 1: Various Payment Methods

2.3 Review of previous works

There are quite a number of people who have done this work before. Below are some of the previous works done before.

2.3.1 Restaurant electronic menu, ordering and payment system and method

Jackson Wade (2007) worked on a restaurant electronic menu, ordering and payment system. He stated that the customer, in this case known as the patron would enter the restaurant and review menu and select food and beverages from the menu hence electrically place their orders. The system would then provide the food and beverages orders to the kitchen staff and the patrons are allowed to review, print and also pay their guest check electronically from their restaurant table at their own will without waiting for service or depending upon responsiveness of the staff of the restaurant. That therefore would provide the best possible service in the shortest possible time.

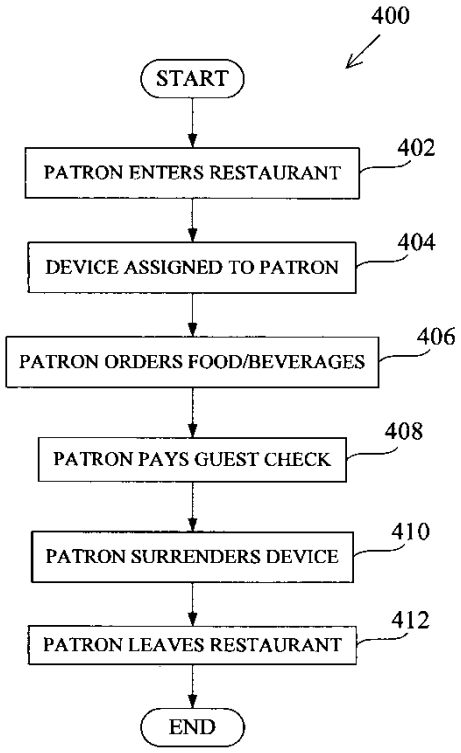

Figure 2: Entire Process

His system would also consist of a top level menu that would allow the patrons to view the menu or the specials available at the restaurant on that day and order what they would like to have. The top level menu would also allow the patrons to review or rather pay the guest check. Whenever the patron would love to check their order status, they could do it in the top level menu. Supposing the patrons wish to speak to any staff from the restaurant they would go to the top level menu and click on the option of summon wait staff to table.

FIG. 5

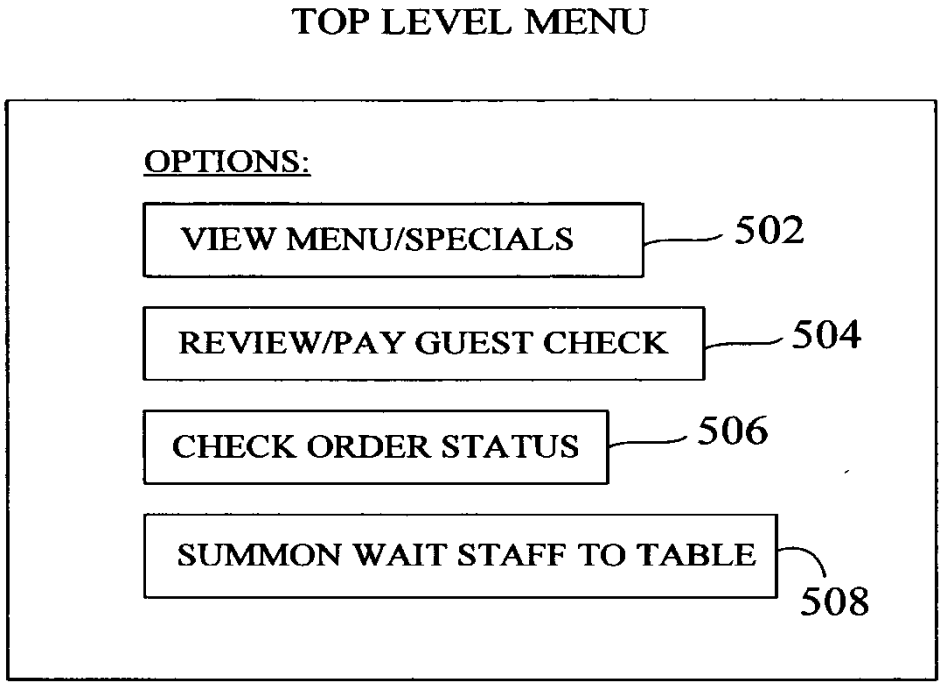

Figure 3: Top Level Menu

However, his system uses devices that are found in the restaurant and the devices are picked from the customers as they walk out.

My proposed system will correct that in that the devices used to order and pay for the food and drinks will be the customers, own devices. The system will also store the customers' expenditure for a period of a month therefore the customer will be able to see and track their expenditure.

2.4 Review of automated food ordering and payment systems

2.4.1 Online food ordering and delivery system

The existing automated food ordering and payments systems in Kenya include Uber eats and Jumia food. There, a customer is able to order food and have it delivered to their actual doorstep. The customers are given payment options. They could either pay using cash on delivery, m-pesa or a card. The advantage of the system is;

i. It can be used in cases where one does not physically want to go to the restaurant.
ii. Customer gets services at the comfort of their home or office or school.

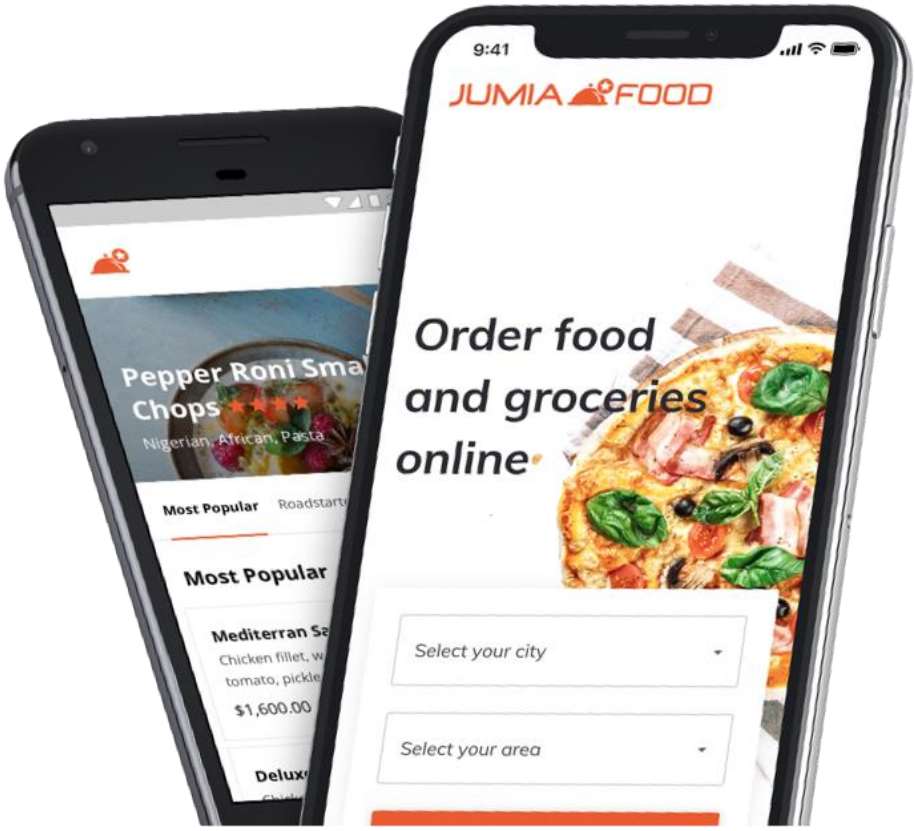

Figure 4: Jumia food application

Figure 5: Uber Eats Application

2.4.2 KFC drive through

Kentucky Fried Chicken(KFC) introduced a drive through restaurant in Kenya in 2011 (Mulupi, 2016).A drive through is a type of restaurant that people can order and pick up their food without having to leave the comfort of their cars and usually consists of a building with a driveway around it. (Mahinda, 2014)

Drivers' first approach a window or a microphone box and place their order and are then required to drive to the other side of the building where their order is delivered through a small window and the customer can pay for it. (Mahinda, 2014)

The drive through restaurants are said to be popular with fast foods. A drive through consists of the following: a speaker for customers to take orders, a free standing sign listing the menu items and prices and windows where employees interact with customers by processing the customers, payment and giving them their order. (Mahinda, 2014)

The drive through restaurant is very advantageous in that it serves those who are on the road so efficiently. They just get to drive through and pick their meals.

However, it still does not work for the sit in customers.

Figure 6: KFC drive through

Figure 7: Customers awaiting service at drive through

2.5 Gaps in Existing Works

The main challenge experienced with the Uber eats and Jumia food is that the system does not have such a wide range of payments. This system then does not work for those who do not have the most common payment options. It only works for those who are not able to reach the restaurant at the moment therefore they order and have the food delivered to exactly where they are.

2.6 Conclusion

In conclusion, my system will do away with having the waiter come pick the order personally from the customers. This will be done by providing the menu on the application where the customers will pick what they wish to eat and the food that they have picked will reflect on the other side of the head of Kitchen.

My application will also allow customers to track their expenditure in the restaurants therefore providing accountability. Also, for the members that pay at the end of the month, the system allows one to keep records of their expenditure therefore they will know how much they will have deducted at the end of the month.

2.7 Conceptual Framework

This is a conceptual diagram which shows how the proposed system functions. The customer logs into the application and orders foods and drinks of their choice and submit it including their table number. The kitchen head gets notified of a new order and clicks open to find out from which table the order has come from and ensures the order is worked on and delivered to the table it belongs. The admin could log into the system to check the number of orders of the day and whether payment by a customer has been made. A customer could choose the mode of payment they want to use. For the members of the sports club, they could choose whether to pay immediately or end month. For the members, there is a limit to which they are allowed to spend in a month.

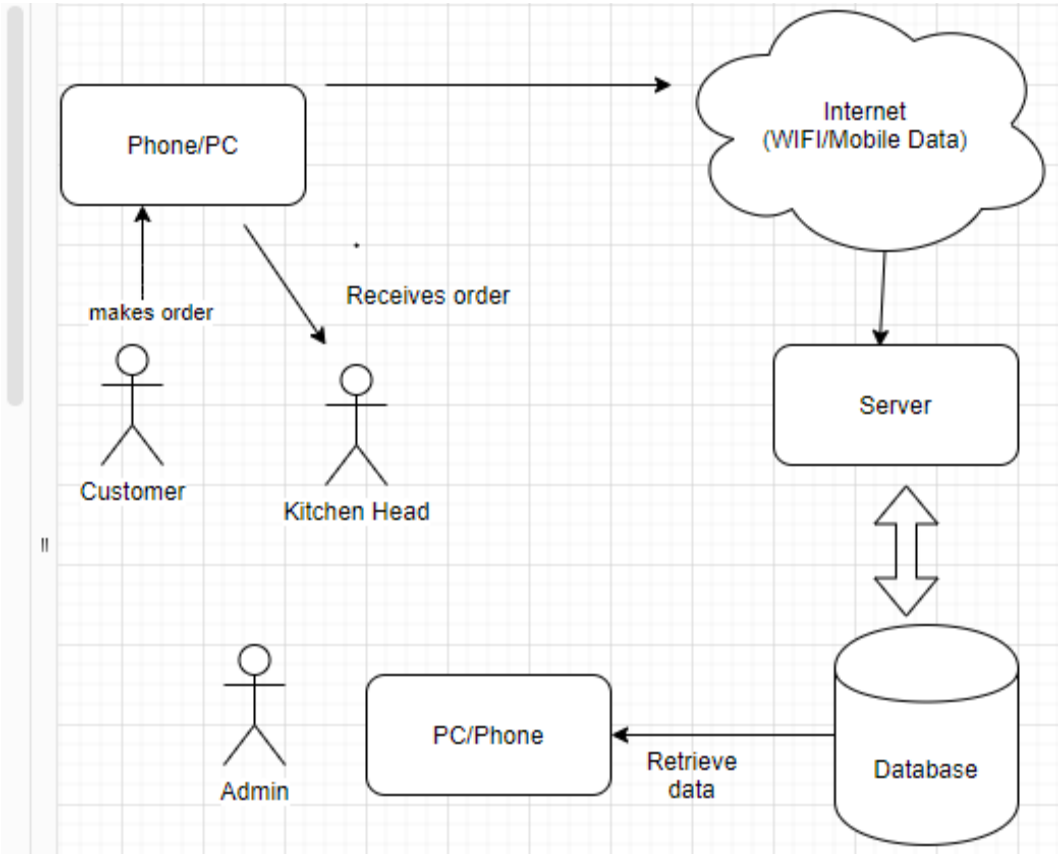

Figure 8: Conceptual Diagram

Chapter 3: System Development Methodology

3.1 Introduction

A system development methodology is an outline or framework to plan and control the process of developing a software application. (TELIOUS TECHNOLOGIES) This chapter is going to describe the methodology that I will use for my proposed system. The aim of the methodology I will apply is to ensure that my proposed system will be able to improve the ordering and payment systems in hotels and restaurants.

3.2 Agile Software Development Methodology

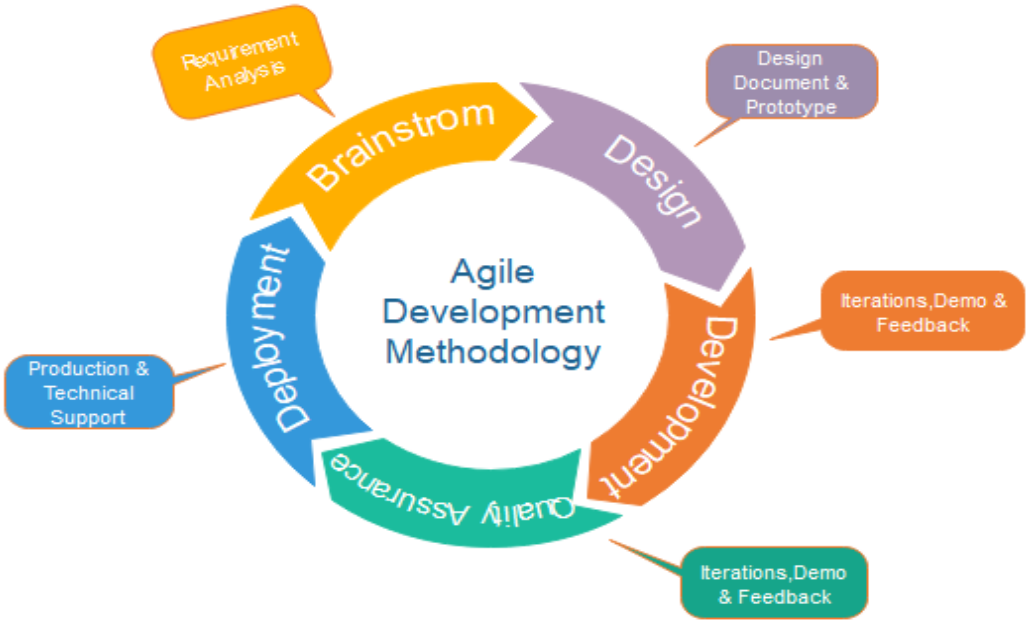

Fig. Agile Model

Figure 9: Agile Software Development

3.2.1 Brainstorm

This is the first stage where the project vision is identified. Requirements are gathered in this phase. Time and effort needed to build project is identified.

3.2.2 Design

This is the second phase where the requirements are defined. Planning is said to be complete when ones backlog is complete and items have been prioritized based on business value and dependency. (Windsor, 2020)

3.2.3 Development

Once requirements are identified, the work begins. This is also known as the construction stage because in this stage, the system is developed to fit requirements provided.

3.2.4 Quality Assurance/Testing

In this phase, quality assurance of the product developed and bugs are looked for. The product is tested.

3.2.5 Deployment

This stage is where the product is released for the user's work environment.

3.2.6 Feedback

This is the last phase which occurs after releasing the product. After receiving of feedback, it is used to better the product.

3.3 Analysis

System analysis is the process of observing systems for troubleshooting or development purposes. (Techopedia, 2020) In developing of the application, Object-Oriented Analysis and Design (OOAD) will be applied. Object-Oriented Analysis(OOA) can be defined as an iterative stage of analysis which takes place during the software development life which aims to model functional requirements of software while remaining completely independent of any potential implementation requirements. (Powell-Morse, 2017)

3.3.1 Functional Requirements

Functional requirements are product features or functions that developers must implement so as to enable the users to accomplish their task or mission. (Altexsoft, 2018)

3.3.1.1 Authentication

The login page should be fully functional in order to allow the user to fully experience the services of the system.

3.3.1.2 Administrative Functions

Only the admin of the restaurant or sports club should be able to login and delete history of expenditure of a user after the user has cleared payment.

3.3.1.3 Transaction corrections and adjustments

The customer should be able to change the means of payment from one to another whenever they choose to.

3.3.1.4 Historical Data

The users should be able to see their expenditure over the past month.

3.3.2 Non-Functional Requirements

Non-functional requirements are those that describe the general characteristics of a system. They are also known as quality attributes. (Altexsoft, 2018)

3.3.2.1 Usability

The system should be easy to understand and use. It should not be complex to a point where the users experience difficulty while using it.

3.3.2.2 Performance

Performance is an attribute of quality that describes the responsiveness of the system to various user interactions with it. (Altexsoft, 2018)

3.3.2.3 Reliability

This defines how likely it is for the software to work without failing for a given period of time. (Altexsoft, 2018)

3.4 Design

System design is the process of designing elements of a system in a way that architecture, modules and components, the different interfaces of those components and the data that goes through that system (Odhiambo, 2018).Object-Oriented Design (OOD) is an extension of OOA process except with a critical caveat: the consideration and implementation of constraints (Powell-Morse, 2017).

3.5 System Development Tools and Techniques

3.5.1 Php

This is the language that will be used to make the system. This is the language that will be used to program.

3.5.2 Notepad++

This is the environment that will be used to build the application.

3.6 Method to be used to test the developed system

System testing is a level of testing that validates the complete and fully integrated software product and its purpose is to evaluate end-to-end system specifications. (GURU99, 2020)

3.6.1 Usability Testing

This focuses on users' ease to use the application and the ability of the system to meet its objectives. (GURU99, 2020)

3.6.2 Regression Testing

This is a type of testing that is done so as to verify that a code change in software does not impact the existing functionality of the product. (Software Testing Help, 2020)

3.6.3 Functional Testing

This type of testing involves trying to think of any possible missing functions and making a list of additional functionalities that a product could have to improve it during functional testing. (GURU99, 2020)

3.7 Domain of Execution

The system will be a web based application. Web application is a type of application software designed to run on a device like smartphone or laptop or desktop. (techopedia, 2018)Web-based applications are faster compared to mobile-apps because they are designed with efficiency in mind and they also have greater functionality meaning they can easily integrate with other features and tools in a device. (The portal agency, 2019) (Shutterstock, 2003)

Figure 10: Example of login page on mobile application

(Shutterstock, 2003)

Figure 11: Example of mobile application

3.8 Proposed Modules and System Architecture

3.8.1 Administrator Module

This is the module that will enable the head of the restaurant to add more items in menu or delete items from menu. This module will also allow them to view orders.

3.8.2 User Module

This module will allow the customers to order food from the restaurant. It will also allow the customers to order drinks and light snacks at the restaurant. Finally, it will allow the customers to pay for the food and drinks with a payment method that is most suitable for them.

Chapter 4: System Analysis, Design and Architecture

4.1 Introduction

The purpose of this chapter is to provide a list of the identified system requirements and focus on the approaches that were applied in the process of gathering the requirements; functional and non-functional requirements during the period of system analysis. In this chapter, the system architecture, that entails the web-based application accessed by both the admin and the restaurant customer has been illustrated.

4.2 Requirements Gathering

Both quantitative and qualitative methods were used to gather information on the system requirements. For the quantitative method, I used questionnaires to gather information that would be useful in making of the system. I then analyzed the results and concluded how the Mapishi Hodari web-based system would serve them best.

For the qualitative method, I did interview a couple people within the target market and collected useful information that I analyzed and concluded where the current systems in place fall short.

4.3 System Requirements

System requirements can be identified as the functionality that is needed by a system in order to satisfy the customer's requirements.

4.3.1 Functional Requirements

Functional requirements can be defined as product features or functions that developers must implement to enable users to accomplish their tasks.

The table below shows the functional requirements of Mapishi Hodari web-based system.

ID	Description
FRQ1	The system should allow clients to sign in
FRQ2	The system should allow user log in.
FRQ3	The system should allow user to view menu.
FRQ4	The system should allow user to add food items to cart.
FRQ5	The system should allow user to checkout.
FRQ6	The system should allow the user to pay.
FRQ7	The system should allow user to change password.
FRQ8	The system should allow the user to logout.
FRQ9	The system should allow the admin to login.
FRQ10	The system should allow the admin to add items to the menu.
FRQ11	The system should allow the admin to delete items from the menu.

Table 1 Functional Requirements

4.3.2 Non-Functional Requirements

Nonfunctional requirements can be defined as define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs.

The non-functional requirements are in the table below.

ID	Category	Description
NFRQ1	Usability	The system should be easy to use.
NFRQ2	Reliability	The system should consistently perform well.
NFRQ3	Security	The system should provide security of its users' details.
NFRQ4	Performance	The system should be fast.

Table 2 Non-Functional Requirements

4.4 System Architecture

A system architecture is a model that defines structure and behavior of a system and how its components interact. Below is an image of the system architecture of my system.

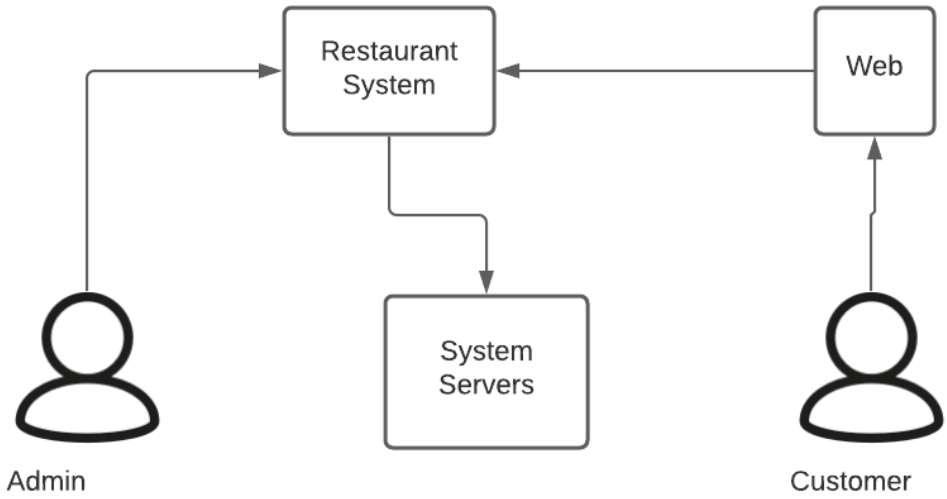

Figure 12 System Architecture

4.5 System Designs

4.5.1 Context Diagram

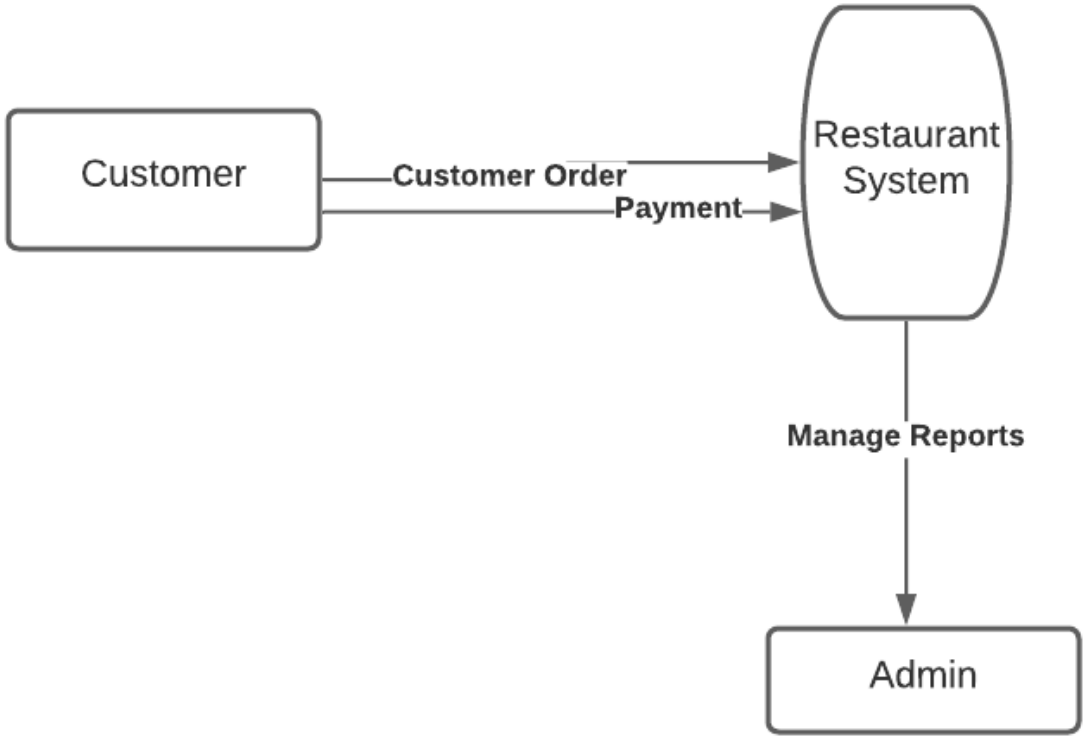

Figure 13: Context Diagram

4.5.2 Activity Diagram

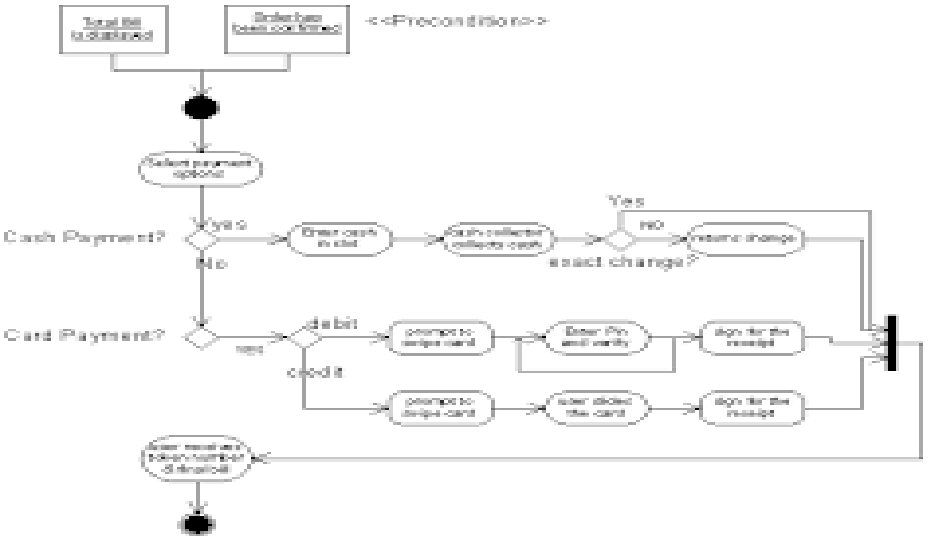

Figure 14 Activity Diagram

4.5.3 ERD

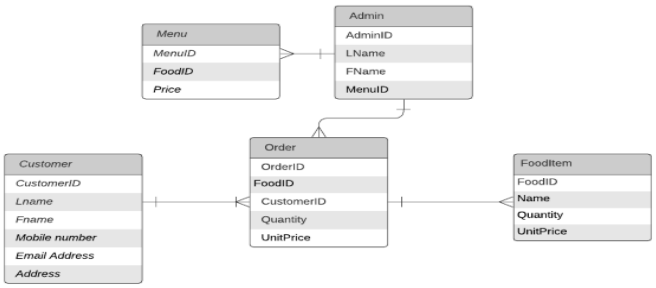

Figure 15 ERD

4.5.4Database Schema

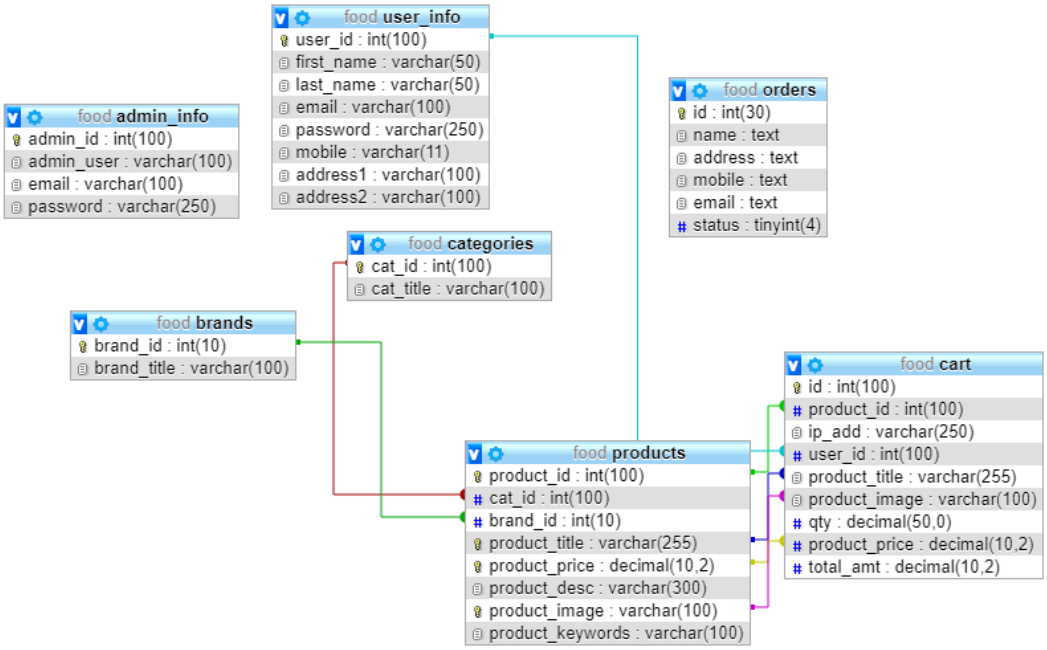

Figure 16 Database Schema

Chapter 5: System implementation and testing

5.1 Introduction

This chapter entails more information on the system and how the various section of the system works. It will also focus more on testing of the system testing and whether the various sections of the system have succeeded or not succeeded. The chapter also plans on detecting system failures so that defects can be found and corrected before the system is fully put into use by the society. The system shall only be implemented when it has been certified it truly works as intended and test on whether or not it can handle a task no matter how it comes to the system.

5.2 System Implementation

Mapishi Hodari system was built following the system analysis and design that was stated in chapter four above in the document. The system has two main users who are the customers and the admin. That is the admin and the member. To create and develop the system the following was done.

5.2.1 Download of Notepad ++

I downloaded notepad++ by searching for it from chrome and following the link and finally being able to download it.

Figure 17 Notepad logo

5.2.2 Downloading and setting up of xampp

I downloaded xampp by searching for it on chrome and following a link to its latest downloads and set it up.

Figure 18 Xampp Logo

Below is an image that shows the page displayed when one clicks the highlighted link. One will choose the download option and the download of xampp will begin.

Figure 19 Xampp link

The next step is to select the folder you wish to install xampp in.

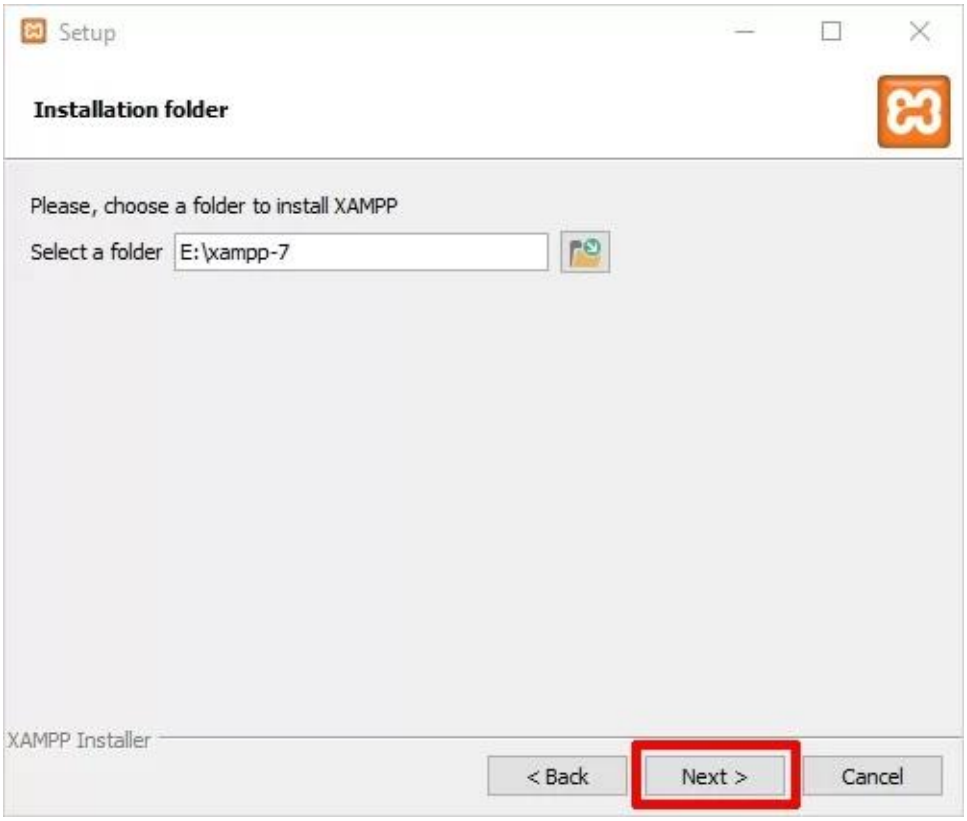

Figure 20 Choose Folder

The next step is selecting the components that are to be installed as shown below.

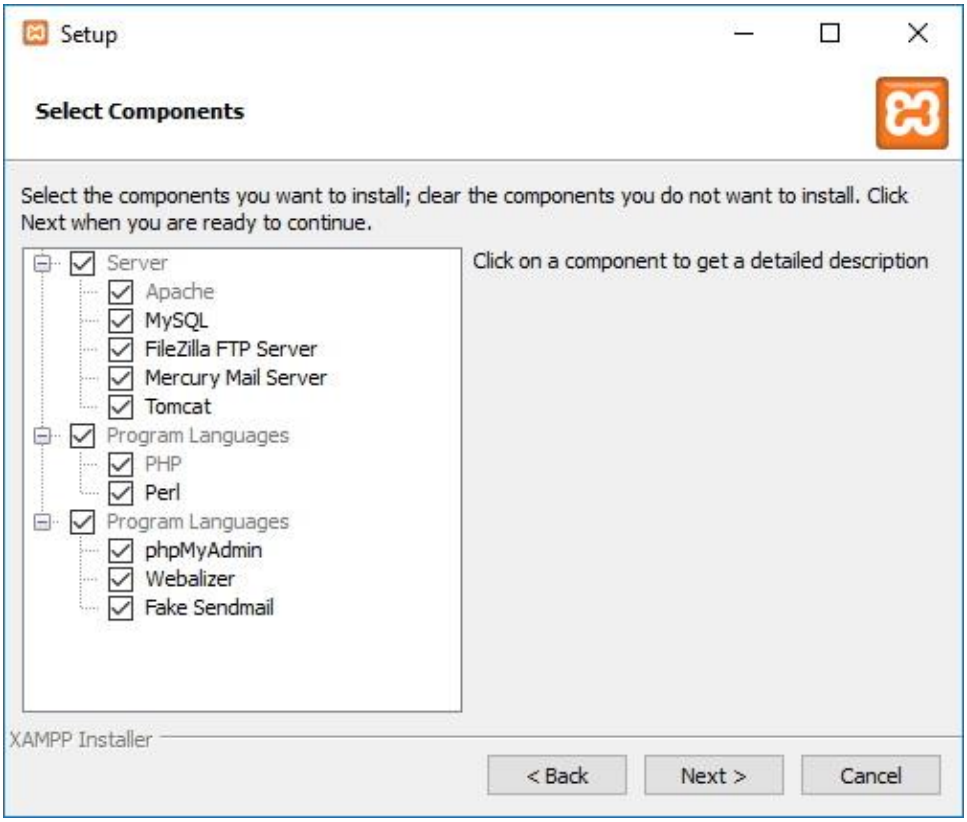

Figure 21 Choose Components

Afterwards the download gets finished and looks like the image below.

Figure 22 Welcome to Xampp

The .last step is to click on the start button on apache and mySQL and also click the admin button on MySQL. It will direct you to the localhost server where databases can be created.

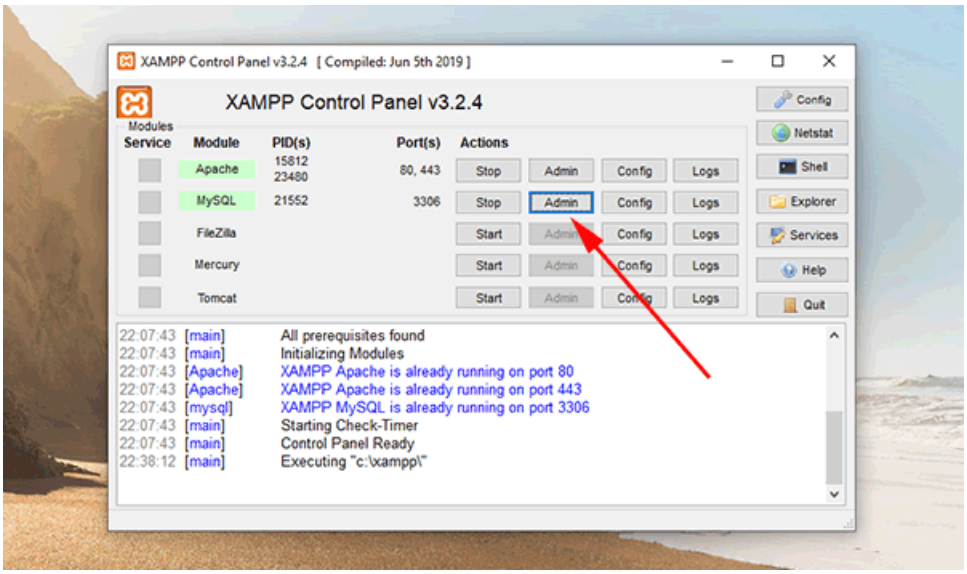

Figure 23 Finish Setup

5.3 System Manual

This system has two major users who are the admin and restaurant customers. For them to access the Mapishi Hodari system, they have to register in the system and their information stored on MySQL database. The image below shows the signup form of the system. This is the form that the customers fill to register themselves in the system.

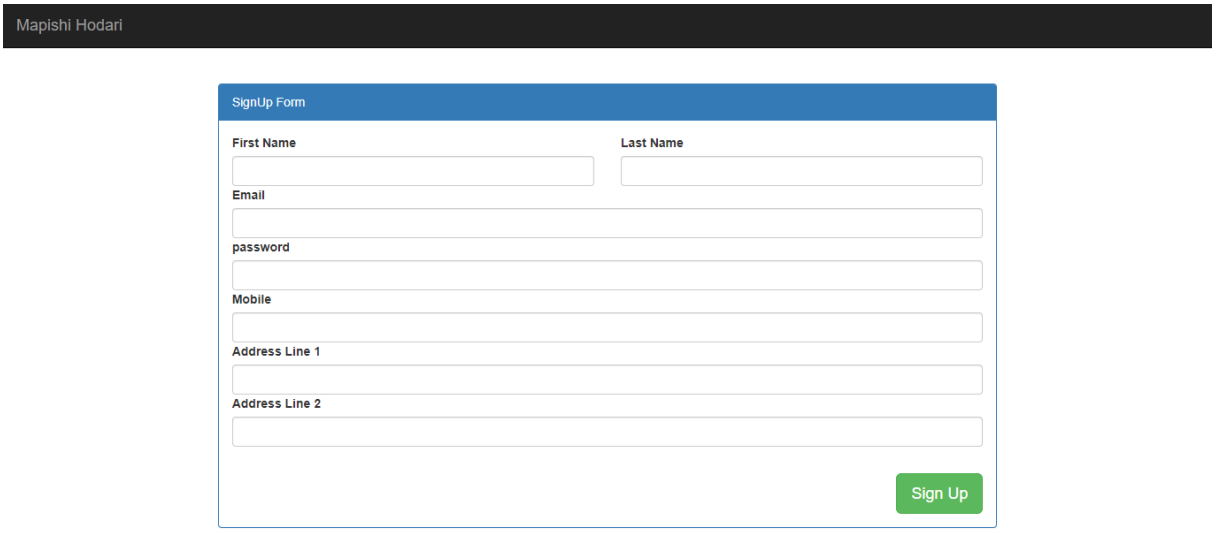

Figure 24 Sign Up Form

Below is an image that shows the login area which is the next step after the customer signs up in the system.

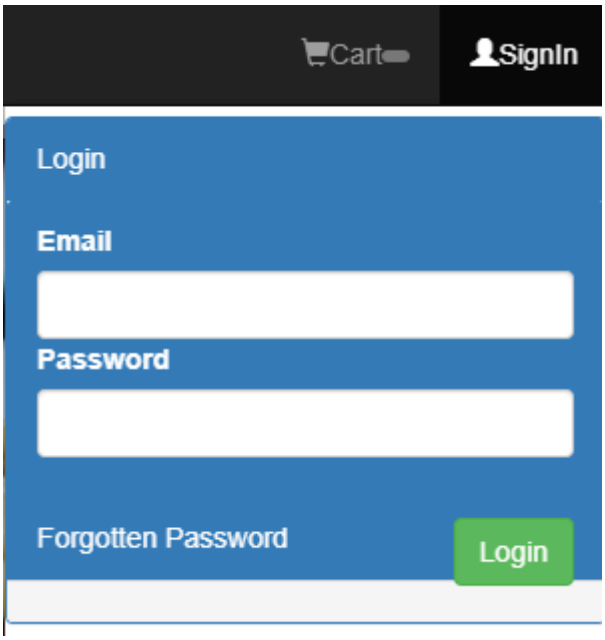

Figure 25 Login Form

5.4 System Testing

This section main aim is to focus on the system and what it does. It will mainly focus on the system testing and whether or not the system has succeeded .

Test ID	Related requirement	Inspection check	Precondition	Results
T1	FRQ1	Does system allow user to sign up and data saved in database?	User should be able to sign up.	User was able to sign up and data reflected.
T2	FRQ2	Does system allow user to sign in to the system and data saved in database?	User should be able to sign into the system.	User was able to log in to the system.
T3	FRQ7	Does system allow user to change password?	User should be able to change the password.	User was able to change the password.
T4	FRQ8	Does system allow user to logout?	User should be able to logout from the system.	User was able to logout of the system.
T5	FRQ9	Does system allow admin to	Admin should be	Admin was able to

		log in?	able to login to the system.	login to the system.
T6	FRQ10	Does system allow admin to add items to menu?	Admin should be able to add items to menu.	Admin was able to add items to menu.
T7	FRQ11	Does system allow user to logout?	Admin should be able to delete items from menu.	Admin was able to delete items from menu.

Table 3 Test

Chapter 6: Conclusions, Recommendations and Future Works

The purpose of this chapter is to give conclusions, the recommendations and future works based on the objectives I had stated earlier in chapter One. This chapter is also going to cover on the system generally and also what the system has been able to achieve at the end.

6.1 Conclusions

The system developed was aimed at solving the problem of the manual ordering system and manual payment. The system will allow the restaurant customers to order directly at the comfort of their homes and pay and receive the food at their doorstep. The customers will be able to experience great service without having a hectic process. The system developed also satisfied the requirement of doing away with manual ordering. The system developed allows customers to register and log in to the system. When the customer logs in they can view the menu and order from the delicacies available. The admin can update the menu by adding more available foods or by deleting the foods that are not available

6.2Recommendations

The system that was developed was only able to solve few of the problems that are faced in the restaurant ordering systems. There are other problems that were to be solved but have not yet. In the future I could incorporate more modes of payment in the system to give the customers a wide range of variety of the payment options.

6.3Future Works

In the future I could incorporate more payment options and increase more functionality on the admins side The system can be improved by allowing the customers to view their previous expenditure and even be able to delete history of expenditure.

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