AN ONLINE CUSTOMER SELF-ORDERING SYSTEM FOR A FAST FOOD RESTAURANT

CASE STUDY: ZONE7 RESTAURANT

By

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DEDICATION

This project is dedicated to my supportive parents : The Late Rev. Atwiine Ferdinand Ibabaza and Mrs. Atwiine Mable, my amazing siblings Kakuru Atwiine Steven, Atwiine Brenda, Atwiine Sharon and Tumwine christopher, my uncle Mr. Godfrey Twahirwa and his wife Mrs. Margret Twahirwa, the Heavenly Springs Church in California, my uncle Mr, Solomon Waako and his wife Mrs. Jolly Waako, my uncle Mr. Edgar Barijunaki and my auntie Julliet Barijunaki, my uncle Mr. Fred Kamugira and his wife Mrs. Suzan Kamugira, Mr. Kiwanuka Achilles and the entire Twahirwa Family.

ACKNOWLEGEMENT

I do acknowledge the presence of God in my life and for all He has done for me. I acknowledge the efforts of Mr. Mugejjera Emmanuel who has been my supervisor in this project. I also recognize the efforts of my parents for the effort they put in to ensure that this project is a success.

I do acknowledge my friends and relatives who prayed for me and advised me so as to accomplish this task.

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To God be the Glory.

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ABSTRACT

The purpose of this project was to develop an online customer self-ordering system that could help Zone7 restaurant to promote proper management of customers' orders and also display the menu online. All information is stored in a database. The Restaurant uses a manual way of placing orders and this makes the process of food ordering and delivery very tedious since the restaurant's workers are burdened with having to take orders and then deliver them when ready.

CHAPTER ONE

1.1. Introduction

This chapter details a general overview of a Fast Food Restaurant business strategy. It outlines the aims and objectives for the project, specifies the minimum requirement, possible extensions discussed and it identifies the deliverables. In addition, the chapter gives a brief overview of the project significance to the developer's degree program and brief information on the layout of this report. This project is aimed at developing a complete online ordering system for use in the food service industry which will allow the restaurants to quickly and easily manage an online menu which customers can browse and use to place orders with just a few clicks.

1.2. Case study: zone 7 restaurant

This study was conducted at Zone 7 restaurant which is located at Old Kireka (Kinawataka) Mbuya Road, Mbuya, in Kampala, Uganda's capital and largest city. Zone 7 provides Breakfast, Lunch and supper services to its customers and offers a wide range of food stuffs from local food to fast foods like French-fries. However, the Restaurant uses the Manual way of placing orders. The restaurant has got a large population to serve and this makes the Process of food ordering and delivery very tedious since the restaurant's workers are burdened with having to take orders and then deliver them when ready thereby making an online customer self-ordering system for the restaurant relevant as it eases the Process of food order and delivery in the restaurant.

1.3. Background of the study

Due to the great increase in the awareness of Internet and the technologies associated with it, several opportunities are coming up on the web. So many businesses and companies now venture into their business with ease because of the Internet One of such business that the

Internet introduced is an online customer self-ordering system. In today's age of fast food and take out, many restaurants have chosen to focus on quick preparation and speedy delivery of orders rather than offering a rich dining experience. Until recently, most of this delivery orders were placed via physical interaction with the restaurant's staff, but there are many disadvantages to this system.

The online customer self-ordering system is one of the latest services most fast food restaurants in the Africa are adopting. With this method, food is ordered online and delivered to the customer. This is made possible through the use of electronic payment system. Customers pay with their credit cards, although credit card customers can be served even before they make payment either through cash or cheque. So, the system designed in this project will enable customers go online and place order for their food.

What is proposed in this research is an online customer self-ordering system originally designed for use in college cafeterias, but just as applicable in any food delivery industry. The main advantage of this system is that it greatly simplifies the ordering process for both the customer and the restaurant. The system also greatly lightens the load on the restaurants end, as the entire process of taking orders is automated. Once an order is placed on the web page that will be designed, it is placed into the database and then retrieved, in pretty much real-time, by a desktop application on the restaurants end. Within this application, all items in the order are displayed, along with their corresponding options and delivery details, in a concise and easy to read manner. This allows the restaurant employees to quickly go through the orders as they are placed and produce the necessary items with minimal delay and confusion. The greatest advantage of this system is its flexibility.

1.4. Problem statement

Nowadays, many restaurants are still using the traditional way of taking order services, as we can see that the waiter uses a pen and a paper when they take the customer's order. This is a low efficiency method, inconvenient and may contain mistakes. For example, if the waiter loses his order paper in the hustle or in another situation or the waiter's handwriting is hard to understand by other people and this may cause the kitchen team and the receptionist to mess up the orders and also may cause calculation errors. This situation may cause the customers to get fed up if it often happens and not come again and this will cause a big impact on the restaurant. By using the online customer self-ordering system, It makes the ordering system more efficient and can help the manager to avoid human error and enhance the business development. This proposed system is more systematic and can guide the staff to avoid any order mistakes. Besides the efficiency service, by using this system, it provides better quality service to customers and attracts more customers to the restaurant. This system uses a desktop application to take orders. The customer's orders are sent to the kitchen through a desktop computer.

1.5. General objective

- To develop the Online Customer Self-Ordering System for a fast food restaurant.

1.6. Specific objectives

1. To analyze the current customer food ordering system in fast food restaurants and the related literature review in order to verify the requirements for an online customer self ordering system.
2. To design an application that will ease the customer food ordering process in fast food restaurants.
3. To develop an application based on the above design.
4. To test and validate the system that will ease the food ordering process in fast food restaurants.

1.7. Significance of the study

In view of the rapid development of computer technology in almost all the fields of operation and its use in relation to information management, it has become important to look into the development of an online ordering system for firms to meet up with demands of the customers. Therefore, the customer self ordering system will help customers and management to:

• Advertise available foods in their company

• Reduce the workload in the present system

• Reduce time wasted in data processing

• Create a platform for online purchase and delivery of fast food

• Keep accurate record on purchased order and delivery.

1.8. Scope of study

In this project, a fast food company is designed and Zone 7 is taken as a case study to enable customers order for food and get it delivered accordingly and also to reduce the time spent in the order and delivery process of customers at the counter and to reduce the work lord on the employees. The following things are among other things that are discussed and what the software would handle.

For the users;

• Create an account for a new user.

• Manage user account.

• Log in to the system

• Navigate the restaurant's menu

• Select an item from the menu

• Add an item to the menu

- Review their order

- Remove or add an item to their current order.

- Provide payment details.

- Place an order

- Receive a confirmation Message for the order placed

- For the administrator;

- Add/update/delete food category from the menu

- Update price for a given food item

- For the staff;

- Retrieve new orders from the database

<center>**CHAPTER TWO**</center>

<center>**LITERATURE REVIEW**</center>

2.1. Introduction

An ordering system is referred to as a set of detailed methods that is being used in handling the ordering process. Food ordering can be computerized or done manually. This option avails the customers with the ability to order for food themselves which is known as the customer self-ordering system. The customer self-ordering system can be defined as a computerized system that is being used by customers to place their own orders in the restaurant and allow the orders to be tracked, in order to prepare and deliver the food to the customers.

2.2. Self-ordering in a restaurant

Self-service or self-ordering in a restaurant industry refers to the restaurant taking orders from customers through applying various types of technologies such as the Internet and many others. Self-service or self-ordering is successful when it is applied at restaurants in many other countries. The usage of the self-service or self-ordering technology is proven to benefit most of the investors.

Rosenzweig et al., 2006 reports that a web-based restaurant ordering method and system wherein the customer accesses the restaurant's own web-site, reads the online menu, and may make dining reservations or place an online order by clicking on the desired menu items, verifying the order, and automatically sending the order via facsimile. The system monitors the order to ensure that no order is lost. The customer can place the order in a few minutes and the order is always correct, and therefore, satisfying to the customer. Moreover, the restaurant receives consistent up-to-date orders and thus can save money while providing better customer service.

<center>6</center>

Wagner, et al., 2001states that an object of the present invention is to provide a method and system for routing food orders over a computer network to enable customers to place food orders such as pizza orders electronically, in a customer centric environment that reflects their needs and preferences, and provides the convenience they have come to expect from any shopping experience.

Bitner, M.J., et. al, 2002. Reports that as companies race to introduce technology that enables customers to get service on their own, managers often find that implementing and managing effective self-service technologies (SSTs) is more difficult than it looks.

Meuter, M.L., 2005 reports that electronic commerce is an increasingly popular business model with a wide range of tools available to firms. An application that is becoming more common is the use of self-service technologies (SSTs), such as telephone banking, automated hotel checkout, and online investment trading, whereby customers produce services for themselves without assistance from firm employees. Widespread introduction of SSTs is apparent across industries, yet relatively little is known about why customers decide to try SSTs and why some SSTs are more widely accepted than others.

Based on study, it is possible for applying the online customer self-ordering system to the fast food restaurants in Uganda. This is because the system can improve workplace efficiency, increase sales of the restaurants as well as reduce making incorrect orders. As a result, it is worth investing in the system, whereby it can shorten the return on investment. In addition, the system should be supported by the food original taste and services to maintain the customers' loyalty and satisfaction. However, widely implementing the food ordering system may cause the influx of labor due to the elimination of waiters in the restaurant industry. Even the system is important to be implemented, yet there is still some risk in other factors such as a direct interaction and restaurant design concept, which need to be considered for ensuring the success of the system.

2.3. E-commerce

Electronic commerce or e-commerce is the exchange of goods and services by means of the Internet or other computer networks. In e-commerce, buyers and sellers transact business over networked computers.

Electronic commerce is also sharing business information, maintaining business relationships and conducting business transactions by means of communication networks. It includes the relationship between companies (business-to-business), between customers (customer-to customer) as well as between companies and customers (business- to-customer). Business to business segment currently dominates the e-commerce while customer oriented segment is significantly lagging behind. E-commerce offers buyers convenience. They can visit the World Wide Web (www) sites of multiple vendors 24hours a day and seven days a week to compare prices and make purchases, without having to leave their homes or offices.

For sellers, e-commerce offers a way to cut costs and expand their markets. They do not need to build staff or maintain a store or print and distribute mail order catalogs. Because they sell over the global Internet, sellers have the potential to market their products or services globally and are not limited by the physical location of a store.

E-commerce also has some disadvantages, however. Customers are reluctant to buy some products online. Online furniture businesses for example, have failed for the most part because customers want to test the comfort of an expensive item such as a sofa before they purchase it. Many people also consider shopping a social experience, for instance, they may enjoy going to a store or a shopping mall with friends or family, an experience they cannot get online. Customers also need to be reassured that credit card transactions are secure and that their privacy is respected. E-commerce is not only widening customer's choice of product and services, but also creating new business and compelling established business to develop

internet strategies.

2.4. History of fast food restaurants

A fast food restaurant, also known as a quick service restaurant (QSR) within the industry, is a specific type of restaurant characterized both by its fast food cuisine and by minimal table service. Food served in fast food restaurants typically caters to a "meat-sweet diet" and is offered from a limited menu; is cooked in bulk in advance and kept hot; is finished and packaged to order; and is usually available ready to take away, though seating may be provided. Fast food restaurants are typically part of a restaurant chain or franchise operation, which provisions standardized ingredients and/or partially prepared foods and supplies to each restaurant through controlled supply channels. The term "fast food" was recognized in a dictionary by Merriam–Webster in 1951.

Arguably, the first fast food restaurants originated in the United States with A&W in 1919 and White Castle in 1921.Today, American-founded fast food chains such as McDonald's and KFC are multinational corporations with outlets across the globe.

Variations on the fast food restaurant concept include fast casual restaurants and catering trucks. Fast casual restaurants have higher sit-in ratios, and customers can sit and have their orders brought to them. Catering trucks often park just outside worksites and are popular with factory workers.

Some trace the modern history of fast food in America to 7 July 1912, with the opening of a fast food restaurant called the Automat in New York. The Automat was a cafeteria with its pre-prepared foods behind small glass windows and coin-operated slots. Joseph Horn and Frank Hardart had already opened the first Horn & Hardart Automat in Philadelphia in 1902, but their "Automat" at Broadway and 13th Street, in New York City, created a sensation. Numerous Automat restaurants were built around the country to deal with the demand.

Automats remained extremely popular throughout the 1920s and 1930s. The company also popularized the notion of "take-out" food, with their slogan "Less work for Mother".

Some historians concur that A&W, which opened in 1919 and began franchising in 1921, was the first fast food restaurant (E. Tavares). Thus, the American company White Castle is generally credited with opening the second fast-food outlet in Wichita, Kansas in 1921, selling hamburgers for five cents apiece from its inception and spawning numerous competitors and emulators. What is certain, however, is that White Castle made the first significant effort to standardize the food production in, look of, and operation of fast-food hamburger restaurants. William Ingram's and Walter Anderson's White Castle System created the first fast food supply chain to provide meat, buns, paper goods, and other supplies to their restaurants, pioneered the concept of the multi-state hamburger restaurant chain, standardized the look and construction of the restaurants themselves, and even developed a construction division that manufactured and built the chain's prefabricated restaurant buildings. The McDonalds' Speedee Service System and, much later, Ray Kroc's McDonald's outlets and Hamburger University all built on principles, systems and practices that White Castle had already established between 1923 and 1932.

The hamburger restaurant most associated by the public with the term "fast food" was created by two brothers originally from Nashua, New Hampshire.

Richard and Maurice McDonald opened a barbecue drive-in in 1940 in the city of San Bernardino, California. After discovering that most of their profits came from hamburgers, the brothers closed their restaurant for three months and reopened it in 1948 as a walk-up stand offering a simple menu of hamburgers, French fries, shakes, coffee, and Coca-Cola, served in disposable paper wrapping. As a result, they could produce hamburgers and fries constantly, without waiting for customer orders, and could serve them immediately; hamburgers cost 15 cents, about half the price at a typical diner. Their streamlined production

method, which they named the "Speedee Service System" was influenced by the production line innovations of Henry Ford.

By 1954, The McDonald brothers' stand was restaurant equipment manufacturer Prince Castle's biggest purchaser of milkshake blending machines. Prince Castle salesman Ray Kroc traveled to California to discover why the company had purchased almost a dozen of the units as opposed to the normal one or two found in most restaurants of the time. Enticed by the success of the McDonald's concept, Kroc signed a franchise agreement with the brothers and began opening McDonald's restaurants in Illinois. By 1961, Kroc had bought out the brothers and created what is now the modern McDonald's Corporation. One of the major parts of his business plan was to promote cleanliness of his restaurants to growing groups of Americans that had become aware of food safety issues. As part of his commitment to cleanliness, Kroc often took part in cleaning his own Des Plaines, Illinois outlet by hosing down the garbage cans and scraping gum off the cement. Another concept Kroc added was great swaths of glass which enabled the customer to view the food preparation, a practice still found in chains such as Krispy Kreme. A clean atmosphere was only part of Kroc's grander plan which separated McDonald's from the rest of the competition and attributes to their great success. Kroc envisioned making his restaurants appeal to suburban families.

At roughly the same time as Kroc was conceiving what eventually became McDonald's Corporation, two Miami, Florida businessmen, James McLamore and David Edgerton, opened a franchise of the predecessor to what is now the international fast food restaurant chain Burger King. McLamore had visited the original McDonald's hamburger stand belonging to the McDonald brothers; sensing potential in their innovative assembly line-based production system, he decided he wanted to open a similar operation of his own. The two partners eventually decided to invest their money in Jacksonville, Florida-based Insta-Burger King. Originally opened in 1953, the founders and owners of the chain, Kieth J.

Kramer and his wife's uncle Matthew Burns, opened their first stores around a piece of equipment known as the Insta-Broiler. The Insta-Broiler oven proved so successful at cooking burgers, they required all of their franchises to carry the device. By 1959 McLamore and Edgarton were operating several locations within the Miami-Dade area and were growing at a fast clip. Despite the success of their operation, the partners discovered that the design of the insta-broiler made the unit's heating elements prone to degradation from the drippings of the beef patties. The pair eventually created a mechanized gas grill that avoided the problems by changing the way the meat patties were cooked in the unit. After the original company began to falter in 1959, it was purchased by McLamore and Edgerton who renamed the company Burger King.

While fast food restaurants usually have a seating area in which customers can eat the food on the premises, orders are designed to be taken away, and traditional table service is rare. Orders are generally taken and paid for at a wide counter, with the customer waiting by the counter for a tray or container for their food. A "drive-through" service can allow customers to order and pick up food from their cars.

Nearly from its inception, fast food has been designed to be eaten "on the go" and often does not require traditional cutlery and is eaten as a finger food. Common menu items at fast food outlets include fish and chips, sandwiches, pitas, hamburgers, fried chicken, French fries, chicken nuggets, tacos, pizza, and ice cream, although many fast food restaurants offer "slower" foods like chili, mashed potatoes, and salads.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

Research methodology has many methods and the scope of research methodology is wider than research methods. Methodology is a systematic theoretical analysis of the methods applied to a field of study. Therefore, from the definition, a methodology covers the methods used within the study.

3.2. Development methodologies

This refers to the framework that is used to structure, plan and control the process of developing an information system.

3.2.1 Prototype model methodology:

This method is iterative and attempts to reduce inherent project risks by breaking a project into smaller segments and provide more ease of change during the development process. Users are involved throughout the process thus increasing the likelihood of user acceptance of the final implementation. The small scale mock-ups of the system are developed following an iterative modification process until the method evolves to meet the user requirements.

Advantages

1. Reduced time and costs

2. Improved   and increased user involvement

Disadvantages

- Insufficient analysis

- User confusion of prototype and finished system

- Developer misunderstanding of user objectives

- Excessive development time of the prototype

- Expense of implementing prototyping
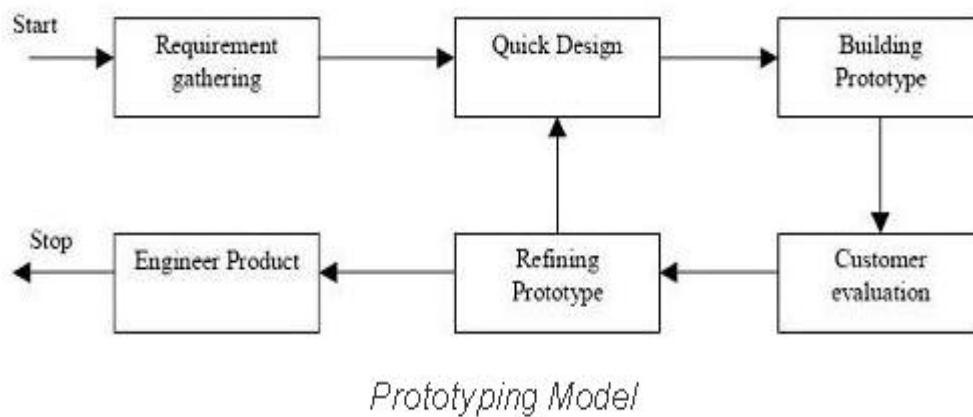
Diagram of a prototype model methodology

Prototyping Model

Figure 3a

Image source Hans Van V.2006

3.2.2 Rapid application development model methodology:

This is a software development methodology refers to any programming language which offers speedier implementation and uses minimal planning in favor of rapid prototyping. Its aim is to produce high quality application quickly at a low investment cost through iterative prototyping, active user involvement and computerized development tools such as Graphical User Interface builders, Database Management System, computer aided software engineering tools, 4th generation programming languages such as C++ and Java, code generators and object oriented techniques. System design method is a widely used computer application development method where its use is often specified as a requirement for government computing projects.
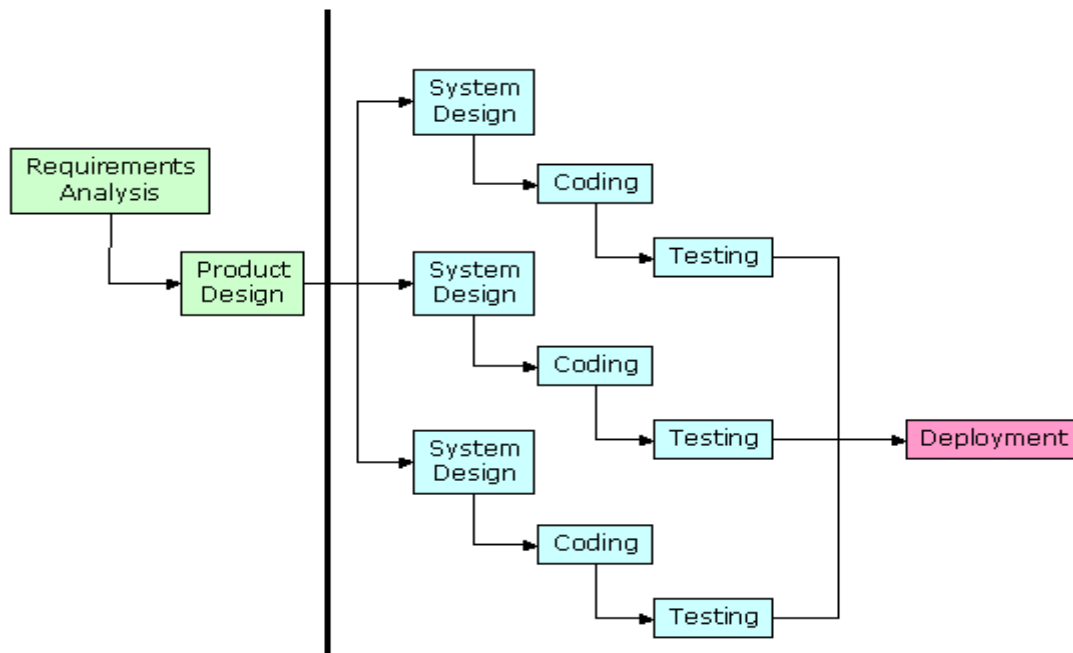
Figure 3b

Image source Hans Van V.2006

3.3. Research design

This describes the nature and pattern the researcher followed while collecting data only of the study area. Here, the researcher used the case study design which consisted of detailed information that was got from the targeted population (customers and staff). This helped to provide a clear understanding of how an online customer self-ordering system operates.

3.4. Study area

This study was conducted from Zone 7 restaurant where the researcher found out that the idea of having an online customer self-ordering system is supported by the Restaurant administration, customers and the restaurant's staff. This enabled the researcher to find out the problems encountered during the process of food ordering and delivery.

3.5. Study population

This refers to the collection of elements, people among others that can be used to investigate a

particular fact or situation. The study population involved Restaurant administrators, customers and the restaurant. Staff that were interviewed and given questionnaires to fill and thereafter, collected and evaluated.

3.6 Sample size and sampling techniques

The population size that was used in the study was composed of restaurant administrators, customers and restaurant staff that were interviewed individually to assess the problems faced by using the manual way of food ordering and delivery and found out how relevant the proposed online customer self-ordering system was to the community.

Sampling techniques refer to methods that the researcher used to identify the respondents who took part in the study. Here, the researcher used random sampling techniques so as to give equal chance and opportunity to the specified respondents who included Restaurant administrators, customers and restaurant staff during the study.

3.7 Methods of data collection

Data collection methods are means through which a researcher gets information from the field or respondents. The researcher used interviews and questionnaires. The researcher administered interviews and questionnaires to those respondents who were able to read and write. The research instruments included direct observations that involved observing what was taking place in the study area and the population, an interview schedule (of when and how the interviews would be conducted) and questionnaire forms (that required the respondents to fill).

3.7.1 Interviews

The interview method of data collection can be defined as a systematic way of collecting data or information from a respondent through asking questions directly from the respondent and also collecting information with the aim of facilitating understanding. The oral interviews were conducted between the researcher and the restaurant's administrators, staff and the customers.

Reliable facts were drawn based on the questions posed to the population by the researcher which helped the researcher in starting the work.

3.7.2 Observation

The observation method was used to collect factual and relevant information such as observing the time customers spend waiting to make food orders until the time of being served and inspecting them so as to make a clear definition. This methodology was used because it enables the researcher to get first-hand information. This method helps to answer the research question: what should be done and how?

3.7.3 Document review

Here, the researcher offered time to read relevant documents such as reports from various departments, minutes, restaurant magazines, brochures and books. This method is significant in getting more knowledge about the system proposed (online customer self-ordering system) and information that was already written about the Restaurant for instance the documents like extracts from Restaurant magazines and reports. The information extracted from these sources enabled the researcher improve on the desired system to create.

3.8. Design phase

3.8.1 Design tools

During the design of the system, several tools were used to come up with the designs required. These tools included;

1. A working computer with which the researcher would use to run the different software to come up with several designs.

2. Software tools like MySQL assisted in creating designs of the database and the several relationships between tables. Other software tools like Microsoft Visio. PHP and HTML

would also be used to verify the different designs.

3. Writing materials including pens, pencils and paper which were used to come up with the physical designs of the system.

4. The researcher had the appropriate skills.

3.8.2 Design methodology

This section explains the different tools used to design the system and how the system was designed. The output produced in the Analysis phase is used to guide the design process of this system. During this phase, a database was designed based on requirement needed by this system and an interface was also designed based on output of analysis phase which had been gathered from the organization. The following phases describe how the system was designed in full;

Interface design: This includes the users' interfaces that provide the user with authentication and functionality. The application design developed conveyed a system that is easy to use with all its required functionality.

Database design: This includes coming up with;

1. The conceptual database design which involves evaluating the analyzed information and coming up with a data model.

2. The logical database design which includes mapping the previously obtained data model into a more visualized model called the logical model.

3. A physical database design where the researcher is required to decide on the implementation database management system, and come up with the final design called the physical database design. This design is developed towards the chosen database management system.

3.9 Implementation

After design has taken place, implementation is the final step of the system. For implementation to be successful, there are several tools that were used which include;

3.9.1 Software tools

PHP (Hypertext preprocessor): This is a programming tool used to design interfaces and to connect to databases. This tool was used because it is easier to learn and use efficiently and effectively. This language is also security enhanced and made the proposed system secure. It was furthermore used to create forms, user interfaces, sessions to store user information and other functions that are called since it has robust support for object oriented programming like java and better support for MYSQL through written extensions and error handling.

MYSQL: This is an object oriented programming language used to design and develop databases. MYSQL is scalable and can accommodate large amounts of data. It also provides high level of security to stored information and it further comes with a low manufacture cost compared to others database system applications. This programming language also enabled the researcher to create tables and then normalize them in order to minimize data redundancy and inconsistency.

MS Visio: This was used for modeling purposes and constructing diagrammatic models such as project plans, representing ideas and concepts among others.

Java Script: The researcher used this tool to write functions behind interactive documentation and dynamic effects with additional registration functionalities. This programming language was employed because it is secure and platform independent, compatible with HTML and also interacts with document Object Model to perform tasks that may not possible in HTML.

Hypertext markup language (HTML) used **cascading style sheet (CSS)** were applied to help improve the general outlook of to create the user interfaces and the system.

Dreamweaver: This is a programming tool used design graphical user interfaces.

3.9.2 Hardware tools

Computer systems: These are electronic devices that perform both mathematical calculations and logical operations especially one that can process store and retrieve large amounts of data very quickly. The researcher used a computer to design and develop the online customer self-ordering system.

3.9.3 Implementation Strategy

The user login page is the only entry point into the system and it provides authentication through which the user is able to access the system according their access levels. If both the user name and password are correct, the procedures allow the user to access the system. All the user interfaces are accessible by the user according to the access level of the user. That is to say, a customer can login and access the menu but cannot edit the menu.

To access this database, the administrator is required to provide a password to modify the database structure or to set other access rights and levels.

3.10. Conclusion

This chapter discusses the fact finding techniques for the proposed online customer self-ordering system. The chapter further discusses the development tools that the researcher employed throughout the design phase. The researcher used Rapid Application Development Model Methodology because it produces applications more quickly and to business focus, tends to produce applications at a lower cost than waterfall, incremental and spiral frame work models.

CHAPTER FOUR

FINDINGS AND ANALYSIS

4.1. Introduction

This chapter focuses on the outcome of the research and analysis of the existing system as obtained from the information gathered from the field. Analysis of the system includes; the structure, processes involved, advantages and shortcomings of the current system. This section also includes the requirements of the proposed system as obtained from the analysis of the findings from the field research of the case study.

4.2. Findings

The research results obtained indicate that Zone7 restaurant which is located at Old Kireka (Kinawataka) Mbuya Road, Mbuya, is relatively one of the growing restaurants in Kampala, Uganda's capital and largest city. Zone7 restaurant provides Breakfast, Lunch and supper services to its customers and offers a wide range of food stuffs from local food to fast foods like French-fries. However, the Restaurant uses the Manual way of placing orders. The restaurant has got a large population to serve and this makes the Process of food ordering and delivery very tedious since the restaurant's workers are burdened with having to take orders and then deliver them when ready thereby making an online customer self-ordering system for the restaurant relevant as it eases the Process of food order and delivery in the restaurant.

The restaurant currently has no electronic management system so all the data is captured, manipulated and stored in the book of records. It's done manually were by a customer has to move to the restaurant physically so as to order for meals. In this process, the waiter uses a pen and a paper when they take the customer's order. This is a low efficiency method, inconvenient and may contain mistakes. For example, if the waiter loses his order paper in the hustle or in another situation or the waiter's handwriting is hard to understand by other people and this may

cause the kitchen team and the receptionist to mess up the orders and also may cause calculation errors.

4.3. The structure of Zone7 restaurant system.

Zone7 restaurant currently has a manual system where waiter uses a pen and a paper when they take the customer's order.

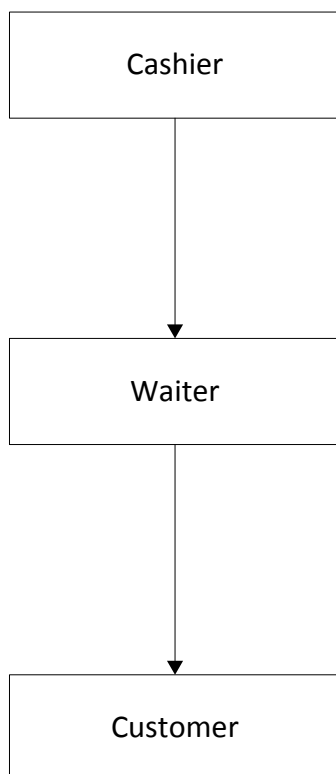Illustration of the current system at Zone7 restaurant

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┌──────────────────┐
│     Cashier      │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│      Waiter      │
└──────────────────┘
          │
          ▼
┌──────────────────┐
│     Customer     │
└──────────────────┘
```

Figure 4a

The management of Zone7 restaurant has currently not yet realized the need for an online customer self-ordering system. This will be there with changes in time as customers increase in number to be handled manually.

The analysis was aimed at identifying the problems. In analyzing the present system, data was collected through interviews and observation. Also in this chapter, we shall see a number of design tools used in the design and implementation of this project.

4.4. Weaknesses of the current system

1. Time wastage. There are always long queues of customers waiting for their orders to be taken during lunchtime as the waiters cannot attend to everyone at the same time..

2. Insecurity of the organization's information. This comes as a result of records being kept in form of book records that can easily be manipulated or destroyed.

3. Difficulty in tracking customers past history. This prevents the restaurant from knowing its loyal customers.

4. Manual work consumes large volumes of data. The paper work is bulky, a factor that makes data retrieval difficult. A lot of time is spent when the manager has to go back and check for data stored in the book.

4.5. Merits of the proposed system

1. The proposed system should allow the authorized user to access the necessary information needed for example view the menu page, login and order meals.

2. Security of data. It should provide security from non-legalized users in order to promote privacy of customers' information. This should be through provision of functionalities of login and password. The system users will be given different user names and passwords.

3. User friendly and interactive interface with provision for customer to view menus. This enables the customer to know what foods have been prepared on a given day.

4.6. Requirements

4.6.1 User requirements

According to Addison Wesley, 2001, requirements are seen as a high level, abstract statement of service that the system should provide or a constraint on the system .It is important to get users of the system fully involved. Stake holders who will be using the system have to be

approached and their views have to be got regarding the new proposed system. The following are some of the expected requirements of the proposed system.

1. The system that is easy to use.

2. The system that allows the administrator to quickly go through the orders as they are placed and produce the necessary items with minimal delay and confusion.

3. A system that also makes it easy for administrator to update information easily.

4. A system that restricts access to information to only authorized personnel.

5. A system that is faster, flexible and convenient.

4.6.2 Organizational requirements

A successfully installed system will require maintenance. When the system is installed, the organization will need to analyze the costs and the benefits arising from the introduction of the new system.

4.6.3 Functional requirements

Functional requirements define the capabilities and functions that a system must be able to perform successfully. The functional requirements of this online ordering system include:

1. Login and out functionality.

The system should have a login functionality to allow only access by authorized users (administrator and customers) and should be able to logout after use.

2. View menu list

The system should be able to display the menu with prices of the items.

3. Data storage

The system should also capture and store customers' information into a database.

4. Take orders

The system should be able to take orders from the customer..

5. Update

The system should allow the administrator to update additional information (description, photo, etc.) for a given food item and also their prices.

4.6.4 Non Functional Requirements

These refer to characteristics and constraints with which the system must comply. It's concerned with quality aspects of software system and good user experience such as performance, security, availability. Some of the non-functional requirements include;

- Reliability

The system will be expected to have sufficient capacity to store all data for the system to function optimally.

- Security

The system will be expected to have security functionalities like the user name and password. This will prevent unauthorized personnel from accessing the data.

- Performance /Time response

The system is expected to have a fast response when a user enters information.

- Adaptability

The system should be easy to maintain and is expected to have the ability to accommodate new technologies in which it can run on the latest versions of operating systems.

- Scalability

The system should be able to accept future improvements in value and quality.

4.6.5 System requirements

These consist of the hardware and software components of a computer system that are required to install in order to use the software efficiently. The necessary requirements to be able to run the new system are:

1. Open source operating system software. This refers to a program or software in which the source code (the form of the program when a programmer writes a program in a particular programming language) is available to the general public for use and/or modification from its original design free of charge. An example that was used is windows 8.

2. Basic PC platform that is to say Processor: Intel dual core or above, Processor Speed: 1.0GHZ or above, RAM: 1 GB RAM or above and Hard Disk: 20 GB hard disk or above.

3. Database management system software: This is software which is needed to run the centralized database and will be created to store all the needed information and any other data of the organization.

4. Computers: These are full computer systems which include input/output peripherals such as monitor, mouse, printer and CPU (at least 2GHz processing speed).

5. Uninterrupted power supply to ensure a constant access of data.

6. A backup and recovery software. This enables the administrator to recover any data lost.

4.7. Diagrams for the system
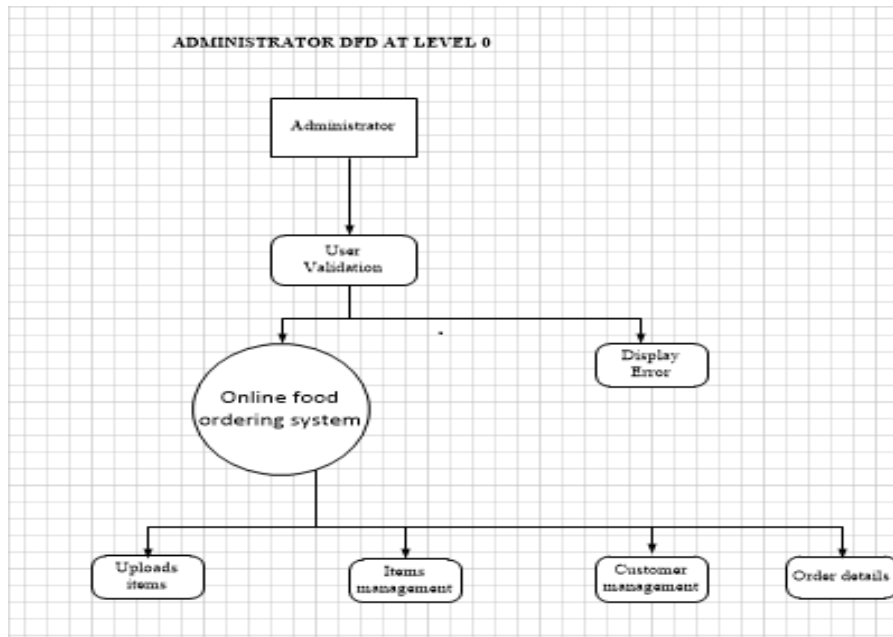
4.7. 1 Administrator data flow diagram at level 0

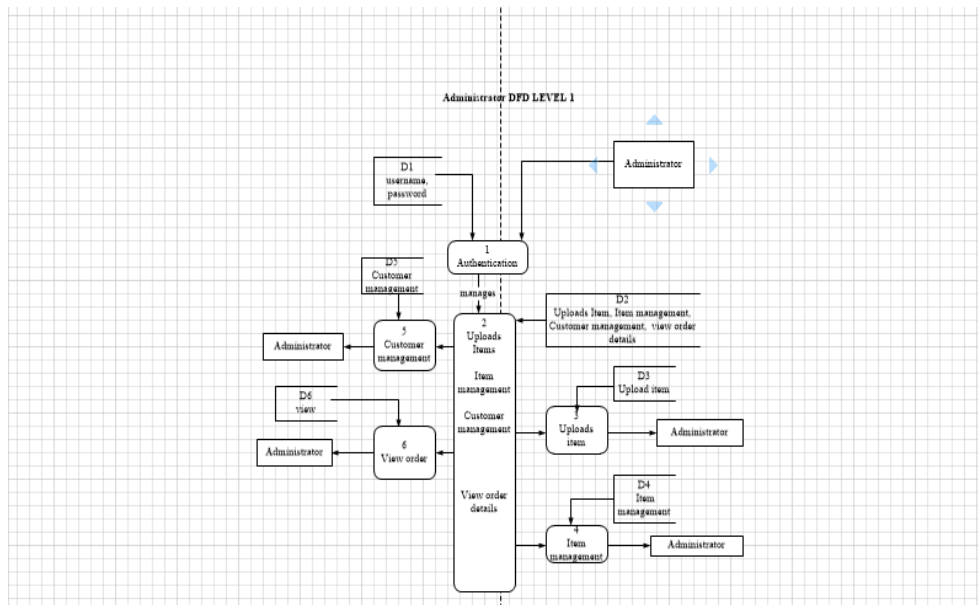**Figure 4b**

4.7.2 Administrator data flow diagram at level 1

Figure 4c

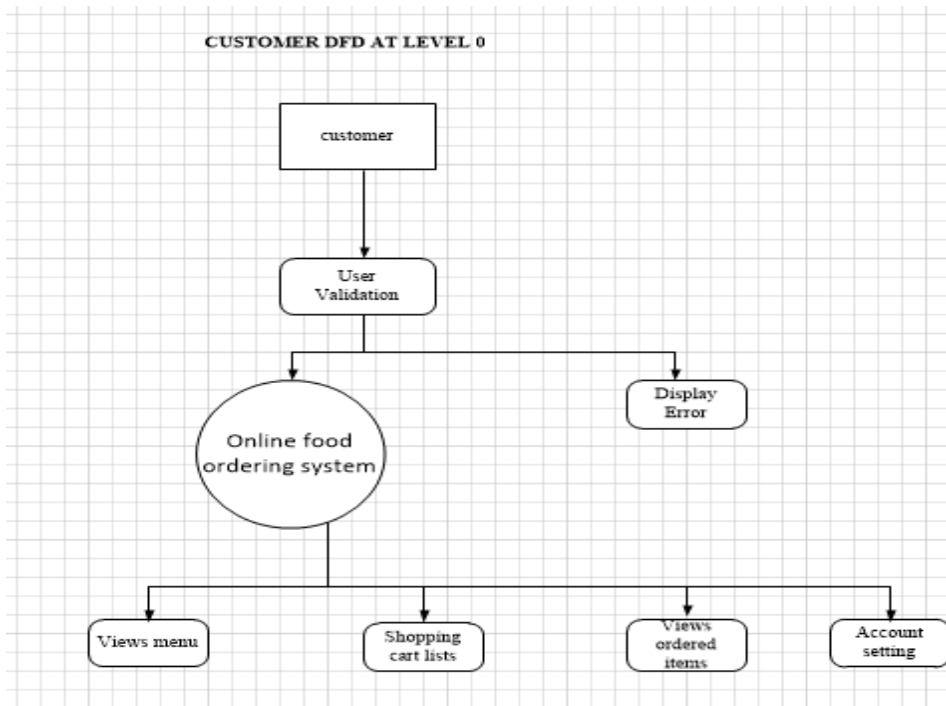### 4.7.3 Customer data flow diagram at level 0

Figure 4d

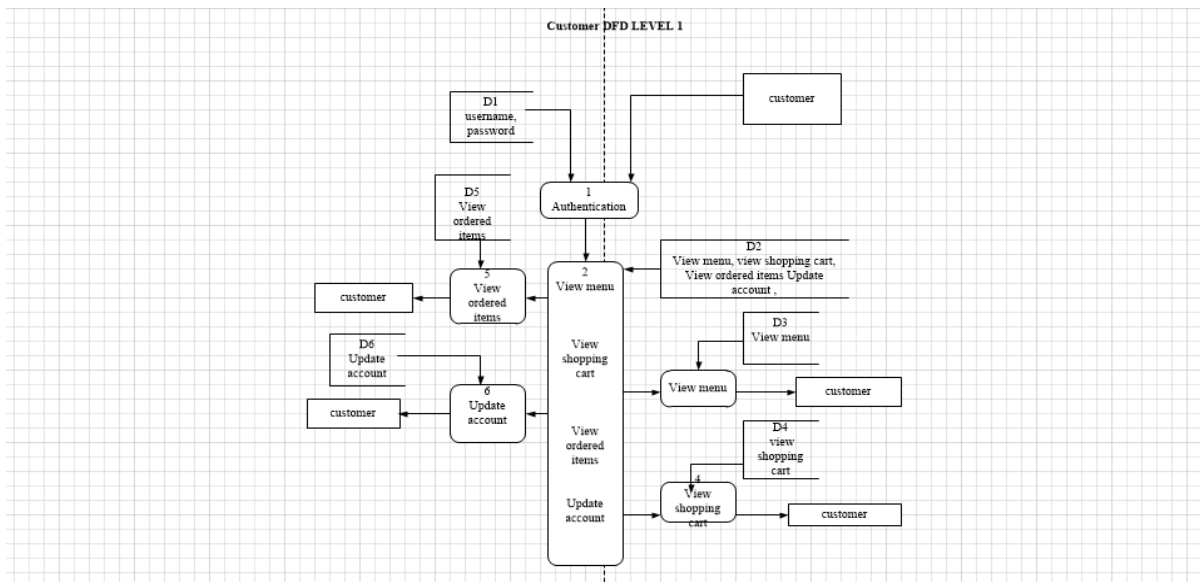### 4.7.4 Customer data flow diagram at level 1

Figure 4e

4.8. Conclusion

This chapter looks at how data is stored and retrieved, advantages and disadvantages of the current system, information requirements, system requirements, function and non-functional requirements, the hardware and software specifications and also the illustrations for the proposed system.

CHAPTER FIVE

IMPLEMENTATION AND TESTING

5.1. Introduction

This chapter has information on the implementation of the project. It includes building the online customer self-ordering system and testing it as per the objectives set in chapter one. This has been reflected in a few screen shots of the project and sample codes

The implementation process includes the following tasks.

-Coding for the system.

-Test plan for the constructed system.

-Installation plan for the proposed software and hardware that will support the system.

-Training plan for the proposed users' of the system.

Technologies used

The online customer self-ordering system is a web based system and therefore the technologies used were web based technologies. The technologies used in terms of programming languages include;

HTML

HTML stands for hypertext markup language and has been used to implement the interface designs which can be viewed from a web browser.

PHP (Hypertext preprocessor): This is a programming tool used to design interfaces and to connect to databases. This tool was used because it is easier to learn and use efficiently and effectively. This language is also security enhanced and made the proposed system secure. It was furthermore used to create forms, user interfaces, sessions to store user information and

other functions that are called since it has robust support for object oriented programming like java and better support for MYSQL through written extensions and error handling

MYSQL: This is an object oriented programming language used to design and develop databases. MYSQL is scalable and can accommodate large amounts of data. It also provides high level of security to stored information and it further comes with a low manufacture cost compared to others database system applications. This programming language also enabled the researcher to create tables and then normalize them in order to minimize data redundancy and inconsistency.

Java Script: The researcher used this tool to write functions behind interactive documentation and dynamic effects with additional registration functionalities. This programming language was employed because it is secure and platform independent, compatible with HTML and also interacts with document Object Model to perform tasks that may not possible in HTML

Other technologies used in terms of software tools include;

Notepad which was used to write the codes that constitutes HTML, PHP,CSS and Java script.

Wamp server which was used to validate, test and run the PHP and MYSQL codes.

MS Visio: This was used for modeling purposes and constructing diagrammatic models such as project plans, representing ideas and concepts among others.

Table 1: Implementation plan

ACTIVITY	DELIVERABLES	TOOLS
Coding	• Complete implementation of the system architecture • Hand code components of the application design	PHP, Java script, HTML, Dream weaver, MySQL, MS Suit and Wamp 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.	
Installation plan Hardware	• Installing hardware • Backup and recovery plan	• Servers • Installation CDs • Hard drives • PHP scripts for migration • MS word
Installation plan Software.	• Installation of Dream weaver. • Installation of Wamp server • Validation of the installed system functionality. • Parallel installation and data migration • Documentation of installation procedure	
Documentation	System documentation and key features	MS word, adobe acrobat
Training plan	User manuals Technical reference	CDs, MS word,

Table 1

5.2. Coding of the system

An online customer self-ordering system was coded using PHP as the main programming language; HTML was embedded to produce the structure of all interfaces, CSS to give style to

all interfaces and MySQL queries and functions to query the database. Java script was used to implement from validation. Macromedia dream weaver was used as the code editor. This section examines the coding practice and implementation style used by the developer to create a restaurant system.

5.2.1 Interface implementation

Login interfaces

On this first login page only the administrator can login to access customers' information and edit it.
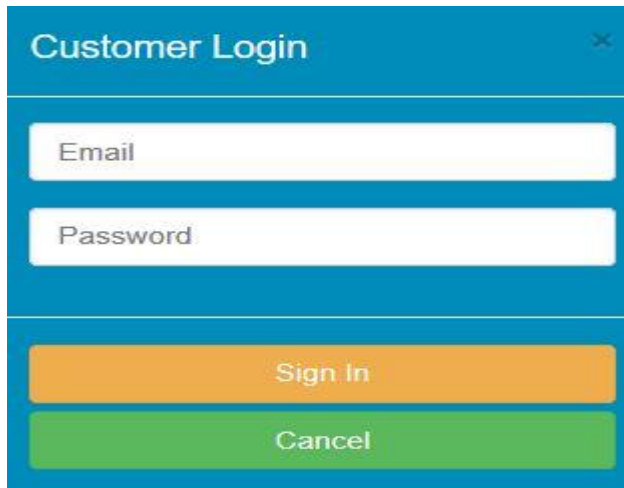
Administrator log-in page.

Figure 5a

Source: Primary data.

This second login page is for only customers that already signed up to login and access the food of the day.

Customers' login page

Figure 5b

Source: Primary Data.

Home page

This is the first page of the web site. It introduces one to the system and shows the available links to the other pages. The links show how many pages are active on the web site. It also tells a brief history about the restaurant, visualization and services offered by the system.
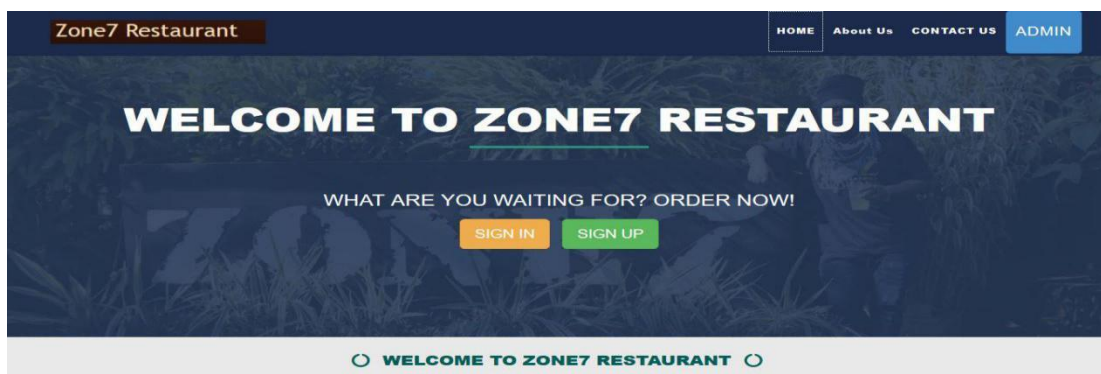
Home page

Figure 5c

Source: Primary data.

Menu Page: This shows the different foods and their prices.
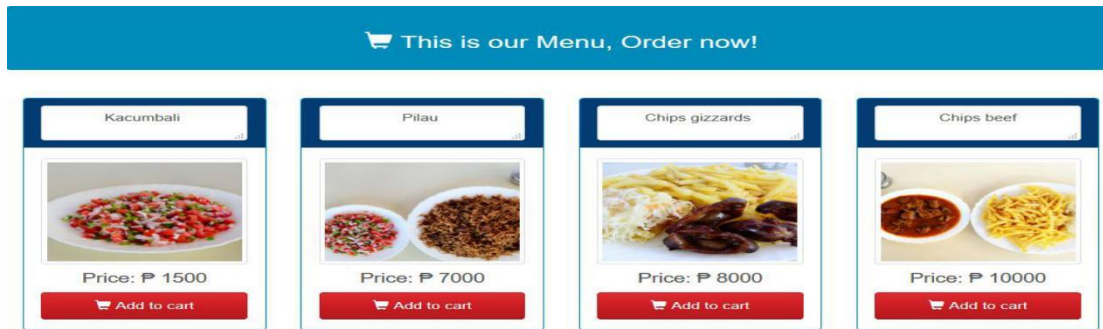
Menu page

Figure 5d

Contact page: This shows the location, contacts of Zone7 restaurant and also provide a feedback.
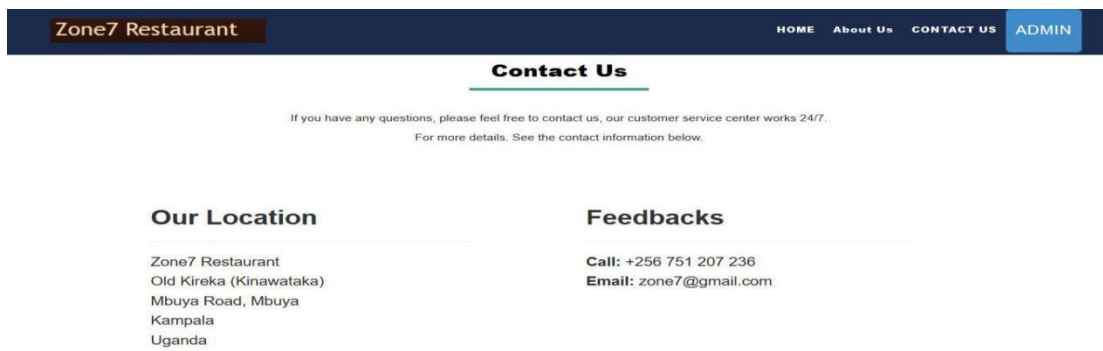
Contact page.

Figure 5e

Administrator's page after login: Here the administrator can view the customer's order. Reset the order and delete the customer's account.

Administrator's page after log-in.

Figure 5f

Customer's page after login: Here the customer can access the menu, add items to the shopping cart, view ordered items, view previous orders and update account information.

Customer's page after log-in.

Figure 5g

About us page: This shows the mission and vision of Zone7 restaurant.
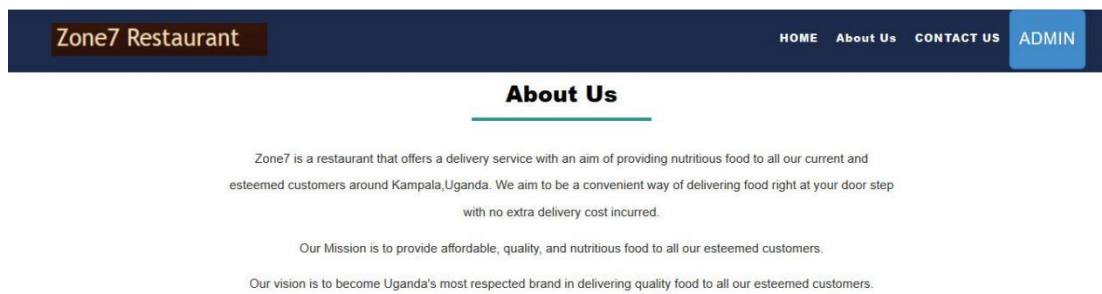
About us page.

Figure 5h

CHAPTER SIX

DISCUSSION, CONCLUSION AND RECOMMENDATION

6.1. Introduction

This section presents the comparison of the project's findings and the manual system.

6.1.1 Comparison

This system is convenient in terms of availability because Customers can make orders online and also know what food is available on a single click, compared to the manual system whereby the customer has to first ask for the menu before making an order.

6.1.2 Opportunities

At the initial stage of the implementation, the administrator was asked to compare the possible advantages of the system in relation to the conventional methods. The following advantages were therefore outlined: prevent long queues during busy hours in the restaurant, it reduces paper work and human errors, reduces the work load of the restaurant's staff and also ensures proper storage of data.

6.1.3 Challenges

Many challenges were met during the implementation of the project.

The system was developed and implemented concurrently with other course units the researcher had to accomplish. This led to implementing of the system in bits which were later on merged.

Due to time and limitation of the knowledge of the developer the system is completed but it could be better than it is.

The climatic changes like heavy rains hindered information gathering at some point because people would not turn up to order for food.

6.1.4 Discussion

In inquiry to generate an online food ordering tool that can be used to promote the proper management of customers' records, Menu and take orders, a number of web pages where constructed basing on the information gathered in chapter one and two of this project. All the necessary areas of concern were catered for in this project. This helped in development of the online customer self-ordering system for Zone7 restaurant. The website was designed using the software prescribed in chapter three of this project. Macromedia dream weaver, note pad++, html and css are some of the software used. The user requirements of information generation and dispatching about the restaurant have also been taken care of in the design stage.

6.2 Conclusion

The purpose of this project was to develop an online customer self-ordering system that could help Zone7 restaurant to promote proper management of customers' orders and also display the menu online. All information is stored in a database.

This purpose was achieved after a thorough analysis of the systems requirements, planning and analyzing web design requirements through conceptual and actual design, testing the prototype which can be reviewed and implemented.

6.3 Recommendation

In the essence of using this system properly;

The researcher's recommendations will be based on how to use the implemented system efficiently, how to keep it functioning and how to avoid defaults in future for better services of the restaurant. Having implemented an online customer self-ordering system, it is clear and evidenced that this system will solve the problems met in creating more space for storing, processing and manipulation of data in the restaurant. To fully gain from the new system, it is required that the users put into practice the following recommendations:

The restaurant administrator should purchase better working hardware and software for proper storage of information in the restaurant.

The administrator should acquire experts to train his/her staff in order to know how to use the system and dispatch. That is to say customers and staff of Zone7 restaurant should also be trained on how the system works.

Implementation: Since the system has been physically created, it requires retesting after the actual implementation. Before implementation, the developer should check if there is appropriate equipment to automate the restaurant system.

Steady electricity: For the system to operate without inconveniences, steady electricity or a reliable power supply is needed so that the system keeps running.

6.4 Future Work and Research

Currently, the system is intended to keep track of customers' records processing and storage. However the researcher recommends that it should be further developed to cater for similar needs in other departments like procurement, administration among others. The researcher could not be able to develop a payment schedule for the customers on the system and used payment on delivery as the medium of exchange. Therefore; he recommends that this system should further be developed to cater for payments online. This research project was aimed at designing and developing an online customer self-ordering system for Zone7 restaurant with the main aim of transition from paper based or manual system to an automated or electronic system.

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