

Towards the digitalization of Restaurant Business Process for Food Ordering in Nigeria Private University: The Design Perspective. A Study of Samuel Adegboyega University Edo State Nigeria

Awojide, Simon¹, Omogbhemhe, I.M.², Awe, O.S.² and Babatope T.S.²

Samuel Adegboyega University, Edo State, Nigeria.

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Abstract- The use of information and Communication Technology (ICT) has improved a lot of businesses by Digitalizing their business processes. Traditional (manual) Ordering of food in a Restaurant in the University Environment has been in practice for long, which brought about piles of Challenges. Digitalizing the Restaurant business processes in Restaurant was the focus of this paper. In view of this, the system developed in this paper was able to solve the challenges of the existing ordering of Food in the restaurant. This paper has provided an overview Food Ordering system (FOS) and has provided a digital design for such system. It also discusses the advantages associated with integrating the system across the Restaurant Business. The FOS developed in this work, when fully implemented, will go a long way to addressing the problem faced by the restaurant management in the area of managing their customer's food ordering, management of customer's information and having quick access to information.

Index Terms- ICT, Food Ordering, Restaurant Business process, Digitalization

I. INTRODUCTION

Food Business in Nigeria is not only a profitable venture, it cannot be affected by economic hard times. This is because regardless of the state of a person's pocket; buoyant or broke, employed or unemployed he must eat. Restaurant business in Nigeria and anywhere in the world is more of a service business than commodity business. Restaurant business is no doubt a lucrative business in Nigeria because it's an all season business. Everyone needs to eat at least once in a day while most people eat three times or more for every 24 hours. Nigeria being a country with huge population and large middle class earners contribute to a potential success of starting and running a restaurant business. According to (Ashutosh et al 2013; Patel et al 2015). Restaurants are one of the favorite's premises with no regard to the actual reasons for visiting restaurants; customer will make orders and wait for the ordered meals. However, it is common if customers complain for not feeling satisfied about the services offered. Food ordering is a completely manual process where a waiter will note down orders from the customers using pen and paper, take the orders to the kitchen, bring the food and

make the bill. According to Prema, Vijitha, Harinisinivas and Kavitha (2017) traditional ordering of food is the method in which customers specify their desired menu to the waiter who takes the order on a paper. Personally he then takes the order to the kitchen department and then he supply the food items to the customer. But this type of business process is time consuming and not comfortable for customer. According to Shinde, Thakare, Dhohne, and Sarkar (2014), the rapid growth in communication technology emergence of wireless technology and android devices has created quite a stir in the business transactions. Business in the hospitality industry has been greatly influenced and competition has increased due to improved food ordering techniques.

According to Mayur & Piyush (2015) Today's era is said to be the world of technology. So many efforts have been taken by restaurants owners also to adopt information and communication technologies. The advancement of Information and Communication Technology has led to an increasing number of industries to use electronic media and corresponding application for information exchange. Patel (2015) stated that, "In the fast paced time of today, where everyone is squeezed for time, the majority of people are finicky when it comes to placing a food order". The customers of today are not only attracted because placing an order online is very convenient but also because they have visibility into the items offered, price and extremely simplified navigation for the order.

In this 21st century, we are living in a progressively Technology driven society. For too long, the restaurant industry has been relying on the same business model that the first restaurateur used so many ages ago: get customers, serve them food. And while that model still lies at the heart of every restaurant, the industry and the clients who frequent it has grown up and evolved since then. Technology is the prime mover of that change in almost every industry and the restaurant business is no exception. In Nigeria today, so many Nigeria private Universities restaurant owner or manager, runs restaurant business in a traditional way, as the case of Samuel Adegboyega University, Students, Staff and Visitors want to be able to order for food and have it delivered to them with much ease and still maintain cost effectiveness. Also they want to be able to do this anywhere and anytime. The manual method has required Staff to abandon their work, Student their studies leaving their state of comfort to meet

their need. It's a good idea to stay current on this developing technology and to investigate the ways it can improve and expand business. With the challenges stated, there is need for a system that offers a wide range of publicity, allow people to place direct order, processing and delivering of food through online system. For this purpose, this research paper focuses on the design perspective of an online based ordering system, there will be a module to handle customers' order, one that will allow the restaurant employees to retrieve and process customers' orders and the third module for administrative operation system. This could also be applicable to any food delivery industry. The main advantage of this system is that it will greatly simplify the ordering process of Staff and Student, Visitors as well as the restaurant employees and the management. The system also greatly lightens the load on the restaurants as the entire process of taking orders is digitalized. Once an order is placed on the webpage that will be designed, it is placed into the database and then retrieved in real-time by any connected system from the restaurants by the restaurant employees. On this application, various items in the order are displayed, along with their corresponding options and delivery details. This allows the restaurant employees to quickly go through the orders as they are placed and produce the necessary items with minimal delay. In the overall this system will offer flexibility to food ordering and delivery.

Problem Statement

With the level of Information Communication Technology in Nigeria today, the manual method of food ordering in University environment is a big challenge this day. Students, Staff and Visitors to order for food and have it delivered to them at their door step with ease and still maintain cost effectiveness. Also they want to be able to do this anywhere and anytime. The manual method has required Staff and Student to leave their state of comfort to meet their needs, managing restaurant operations is more challenging than it appears. A restaurant generally relies on paper-based system for manual information flow. However, such system has its limitations. This is mainly because individuals in the restaurant have limited capability to handle massive information flow when the restaurant is at peak capacity.

II. RELATED WORK

The advancement in information and communication technology has greatly influenced the business transactions. In earlier days, food industry traditionally has lagged behind other industries in adopting new technology. However rapid advances in computer Technology and heightened expectations of consumers have forced the food industry to bring automation in the process. Nowadays, the adoption of wireless technology & emergence of mobile devices has led to automation in the food industry. The business and services in restaurants can be improved with the combination of wireless and mobile technologies. The competition in restaurants with respect to business has increased with the advancements in food ordering techniques (Bhandge, Shinde, Ingale, Solanki & Totare, 2015). Nowadays web services technology is widely used to integrate heterogeneous systems and develop new applications. Here an application of integration of hotel management systems by web

services technology is presented. Digital Hotel Management integrates lots of systems of hotel industry such as Ordering System Kitchen Order Ticket (KOT), Billing System, Customer Relationship Management system (CRM) together. This integration solution can add or expand hotel software system in any size of hotel chains environment. This system increases quality and speed of service. This system also increases attraction of place for large range of customers. Implementing this system gives a cost-efficient opportunity to give your customers a personalized service experience where they are in control choosing what they want, when they want it – from dining to ordering to payment and feedback (Bhargave, Jadhav, Joshi, Oke, & Lahane, 2013).

At today's advanced technologies, the mobile phone is brilliant smarter usage product one. With the help of this smart gadget we can make our usages as smart as possible. Some products are commercially available in market which allows restaurant food ordering through internet, android applications, GSM, Bluetooth, RFID, and Wi-Fi wireless technologies.

Food ordering is a process of ordering food from a local restaurant or food cooperative through a web page or app. Much like ordering consumer goods online, many of these allow customers to keep accounts with them in order to make frequent ordering convenient. (Rajesh, Prabha & Rao, 2015). The rapid growth in communication technology emergence of wireless technology and android devices has created quite a stir in the business transactions. Business in the hospitality industry has been greatly influenced and competition has increased due to improved food ordering techniques. In earlier days, food ordering was a completely manual process where a waiter used to note down orders from the customers using pen and paper, take the orders to the kitchen, bring the food and make the bill. Although this system is simple it requires extensive investment in purchase and storage of paper, large manpower and also is prone to human errors and greater time consumption has created fairly a stimulation in the business transactions. Business in the hospitality industry has been greatly influenced and competition has increased due to improved food ordering techniques (Shinde, Thakare, Dhomne & Sarkar, 2014)

According to the work of Mayur & Piyush (2015) he proposed the low cost touch screen based Restaurant Management System using an android Smartphone or tablet as a solution against the conventional paper based and Personal Digital Assistant (PDA) based food ordering system. The system consists of a Smartphone/tablet at the customer table contains the android application with all the menu details. The customer tablet, kitchen display connects directly with each other through Wi-Fi. Orders made by the customers will be instantly reach the kitchen module. This wireless application is user-friendly, improves efficiency and accuracy for restaurants by saving time, reduces human errors and provides customer feedback. This system successfully overcomes the drawbacks in earlier automated food ordering systems and is less expensive as it requires a one-time investment for gadgets. Likewise, Patel et al. (2015) in his work, the system, implements wireless data access to servers. The android application on user's mobile will have all the menu details. The order details from customer's mobile are wirelessly updated in central database and subsequently sent to kitchen and cashier respectively. The restaurant owner can

manage the menu modifications easily. The wireless application on mobile devices provides a means of convenience, improving efficiency and accuracy for restaurants by saving time, reducing human errors.

III. METHODOLOGY

This paper was carried out using a Design Science (DS) approach. This approach was implemented in Omogbhemhe and Awojide (2017) as defined in the work of peers, Tuunanen, Gengler, Rossi, Hui, Virtanen, and Bragge (2006) as a good approach that provides a method of conducting research provide a model for the research. Hence the process of the design science approach was demonstrated in this paper with the following steps:

- Identification and definition of the Problem: This requires a good understanding of the problem to be solved.
- Devising the method of solution: this stage involved is spelling out the detailed algorithm
- Developing the method of solution: This is developing the solution to the problem in form of a model.
- Demonstration: Demonstrating how efficient will the model solve the problem

- Evaluation: Observing how good the model supports the solution to the problem.

Similarly, the tools employed in development of the front-end and the backend include; Java programming languages, Hypertext Markup Language (HTML), Cascading Style sheet (CSS), JavaScript, Servlet, Java Server page (JSP), Oracle database, NetBeans and Java Runtime Environment.

The Proposed System Model, Architecture and Flowchart

The proposed system developed in this paper is a web based system which has every features and information of the existing system to manage ordering and delivery activities in University restaurant. It has an interface that allows business promotion and menu which allow the customers to make order, view order and make changes before submitting their order. It will also allow them specify mode of payment. It also provide an interface that shows customers' orders to the kitchen staffs for processing and delivery Also provided in this web based system, is the feature of authentication. This will enable only eligible and registered staff of the restaurant to have access to customer's order for food in the restaurant, so that wrong attention will not be given to the user or customer. The system is model into four layers. Customer Application Interface, Application Processing, Database and Staff Application Interface

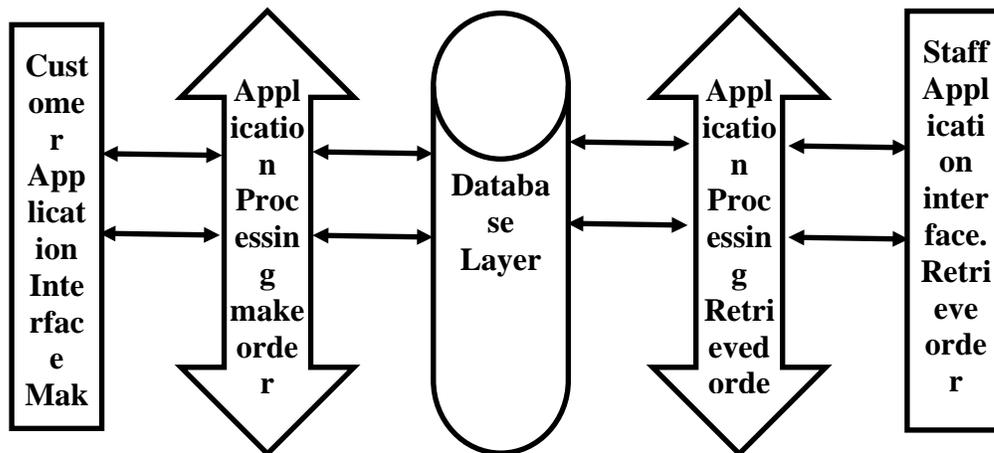


Fig. 1 System Model

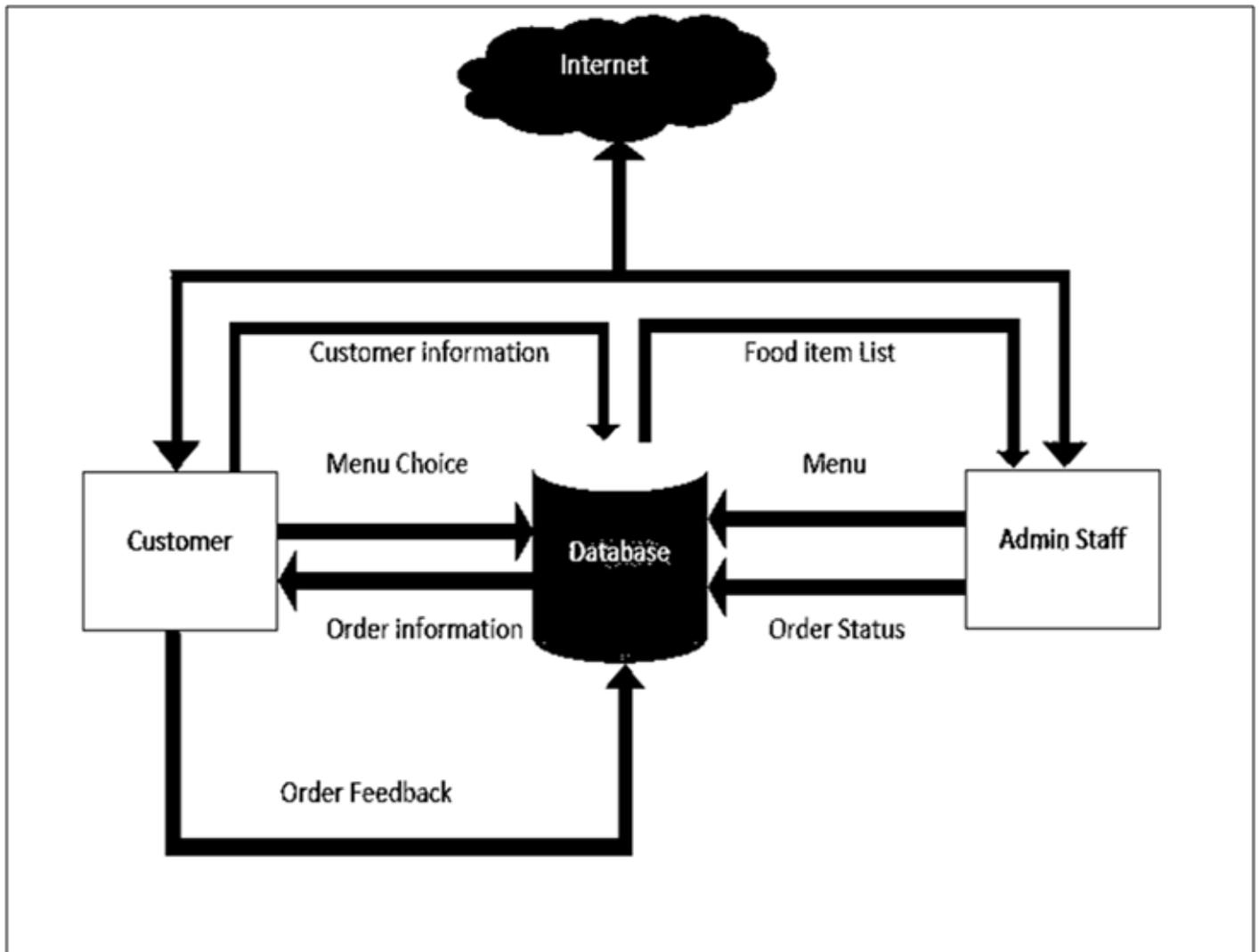


Fig. 2 Architecture of the System

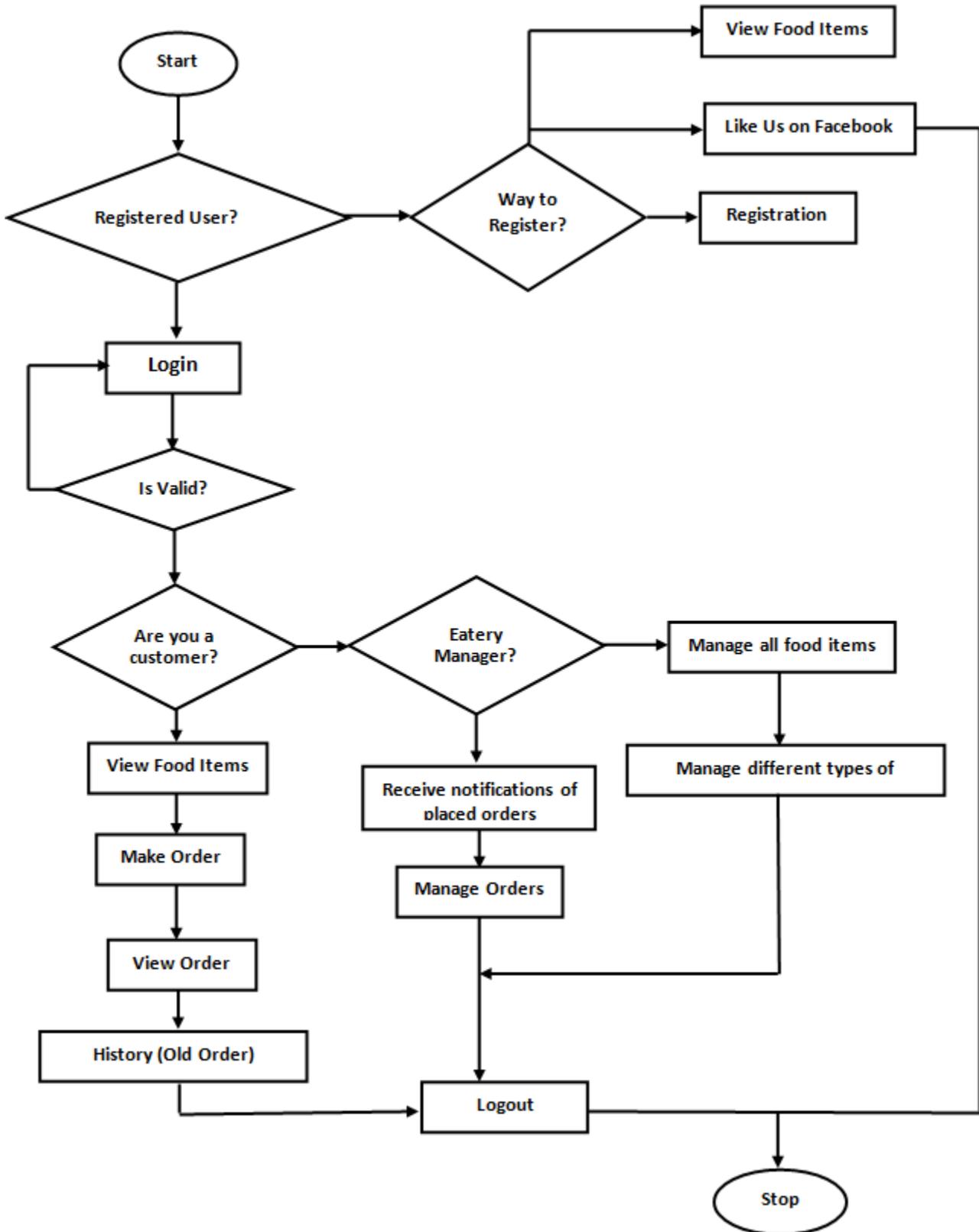


Fig. 3 Proposed System Flowchart

Design of Customer Database Schema

Table 1 below is used to store the information about a customer, like CUSTNAME, PHONE, ITEM_ORDERED, ORDER_DATE, etc. the diagram below shows the schema of the Customer table. From the table we can see the various fields and the type of data to be entered into them.

Table 1. Customer Information

Object Type		TABLE		Object CUSTOMER						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment	
CUSTOMER	CUSTNAME	Varchar2	50	-	-	-	✓	-	-	
	PHONE	Varchar2	15	-	-	-	-	-	-	
	ITEM_ORDERED	Varchar2	50	-	-	-	-	-	-	
	ORDER_DATE	Date	7	-	-	-	✓	-	-	
	QUANTITY	Number	-	-	-	-	✓	0	-	
	ATTENDED	Varchar2	20	-	-	-	✓	'NOT SERVED'	-	
	ADDRESS	Varchar2	100	-	-	-	✓	-	-	
	REMARKS	Varchar2	20	-	-	-	✓	-	-	
	REQUESTDATE	Date	7	-	-	-	✓	-	-	
	REQUESTTIME	Varchar2	20	-	-	-	✓	-	-	
	ORDERID	Varchar2	20	-	-	1	-	-	-	
									1 - 11	

Language: en-us

Table 2 below is used to store the information about Food items. The fields include ITEM_CODE, ITEM_NAME, ITEM_QTY, UNIT_PRICE, ITEM_IMAGE etc. The diagram below shows the schema of the Food items table. From the table we can see the various fields and the type of data to be entered into them.

Table 2 Food items Information

Object Type TABLE Object FOOD_ITEMS

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FOOD_ITEMS	ITEM_CODE	Varchar2	6	-	-	1	-	-	-
	ITEM_NAME	Varchar2	20	-	-	-	-	-	-
	ITEM_QTY	Number	-	-	-	-	✓	-	-
	UNIT_PRICE	Number	-	-	-	-	✓	-	-
	DATE_CREATED	Date	7	-	-	-	✓	-	-
	DATE_MODIFIED	Date	7	-	-	-	✓	-	-
	ITEM_IMAGE	Blob	4000	-	-	-	✓	-	-
									1-7

The System Testing Samples

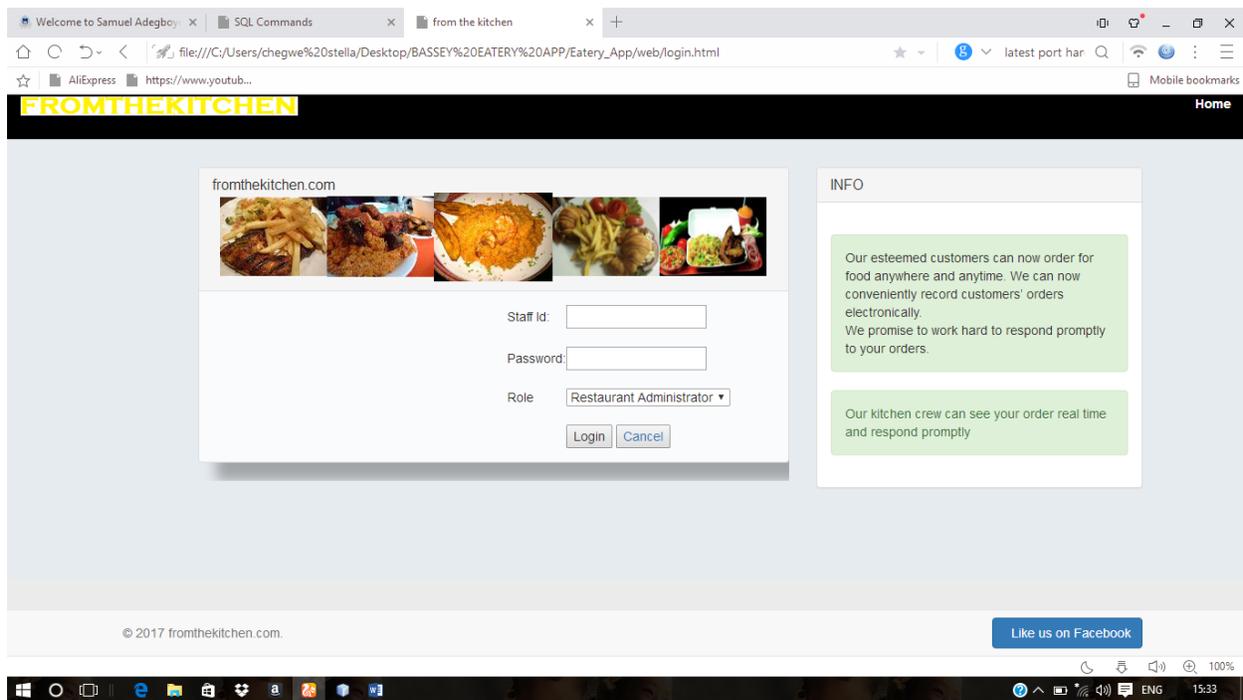


Fig. 4 Staff or Admin Login Page

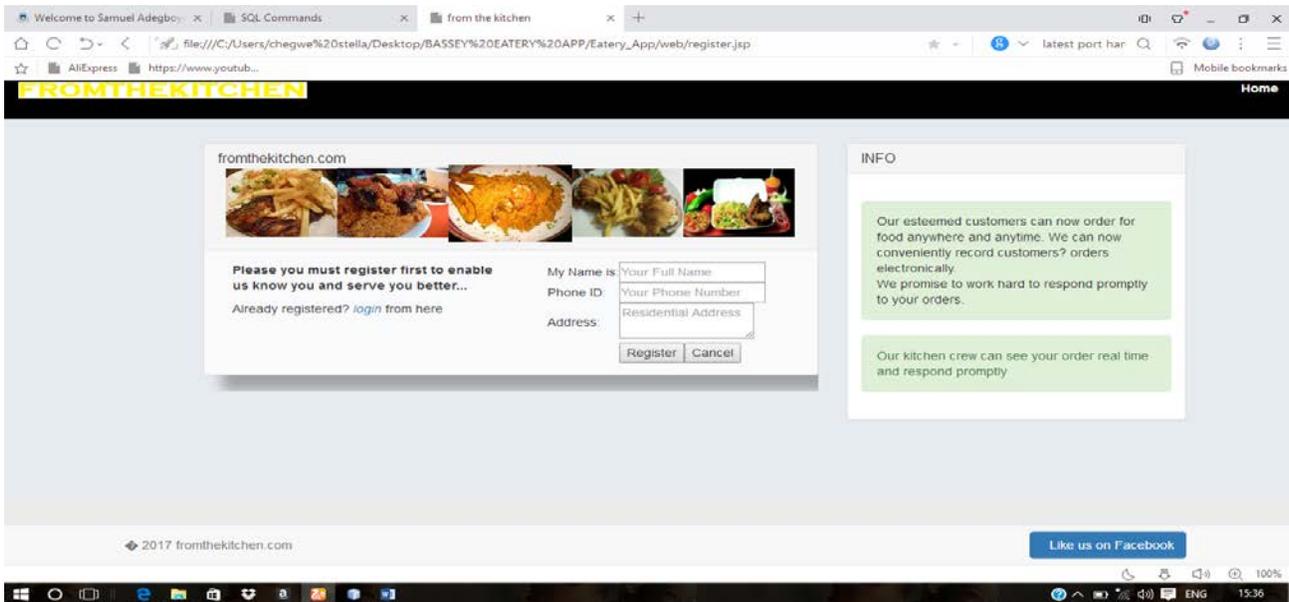


Fig. 5 this allows customers to view and/or change food items ordered and also get notification via sms.

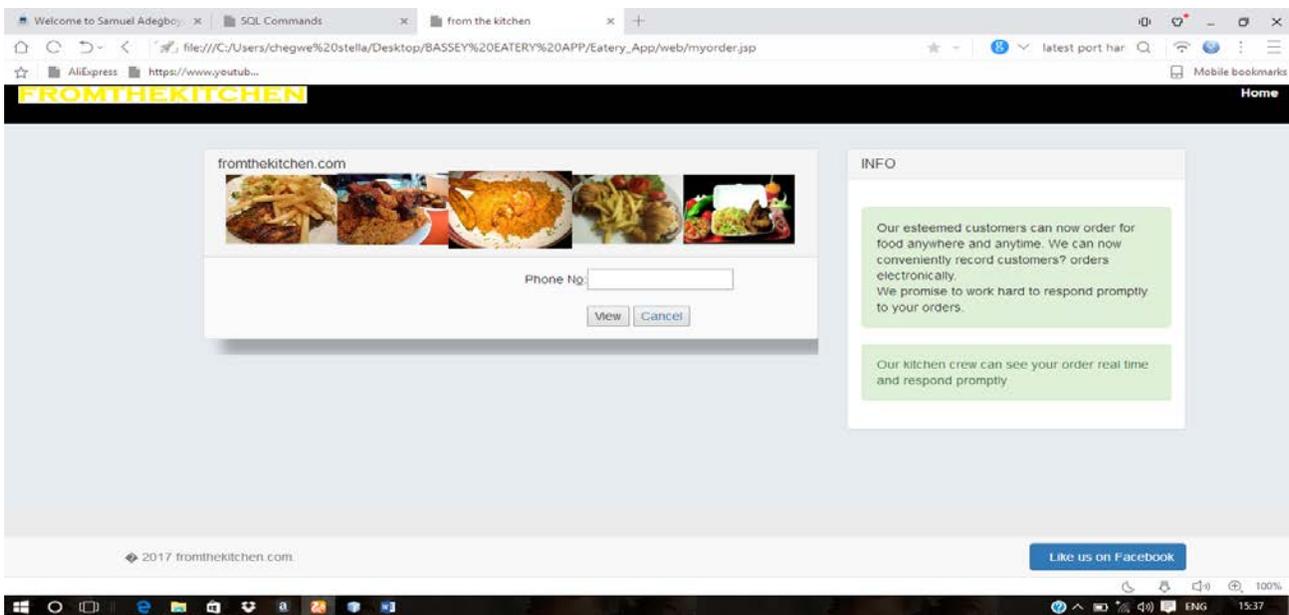


Fig. 6 this menu option allows users to view their orders.

IV. CONCLUSION

Major areas that has to do with automating Restaurants in the University environment were captured in this system. Therefore, deploying a system such as this will be very effective and efficient in improving the services of the university Restaurant for Staff and Students. However, this system can be improved upon in terms of scope and robustness. Thus, we present a digitalized food ordering system with features of feedback. This system is convenient, effective and easy thereby improving the performance of restaurant's staff. It will also provide quality of service and customer satisfaction. Thus, the proposed system

would attract customers and also adds to the efficiency of maintaining the restaurant's ordering and billing sections.

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AUTHORS

First Author – Awojide, Simon, Samuel Adegboyega
University, Edo State, Nigeria

Second Author – Omogbhemhe, I.M, Samuel Adegboyega
University, Edo State, Nigeria

Third Author – Awe, O.S, Samuel Adegboyega University, Edo State, Nigeria

Fourth Author – Babatope T.S, Samuel Adegboyega
University, Edo State, Nigeria

Corresponding Email: simple4real08@yahoo.com