

Design and Implementation of Digital Dining in Restaurants using Android

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Abstract--- The growth of wireless technology and Mobile devices in this era is creating a great impact on our lives. Some early efforts have been made to combine and utilize both of these technologies in advancement of hospitality industry. This paper presents an easy and more subtle way of communicating to realize a wireless food ordering system. This system, implements wireless data access to the servers and food ordering functions through both desktops and mobile devices such as tablets over a wirelessly integrated local area network. In this paper we discuss about the design & implementation of automated food ordering system for restaurants. This 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 and real-time customer feedback.

I. INTRODUCTION

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. In order to overcome these limitations in manual system, some systems were developed later like multi-touchable restaurant management systems to automate food ordering process. A wireless application could be designed and this application is installed on each of the tablets, PC's and phones, the customer selects the food from the menu provided to him and gives the order. The orders from the customer's tablet are sent wirelessly to the kitchen as well as updated on a central database.

The following are some merits of using such an application:

- Due to the tablets, the waiter need not go to the tables to take the order.
- The waiters can spend more time in satisfying the customers and there will be no mixing of orders.
- Status of the ordered food can be checked any time by the waiter as well as customer.

II. LITERATURE REVIEW

Traditional Paper Based System:

One of the widely used food ordering schemes is the traditional paper based system. In this system all records are stored on paper. The main drawback of this system is papers can get easily lost or damaged. There is also wastage of money, time and paper. Paper-based systems do not provide any form of dynamicity. Even a small change requires the entire menu -card to be re-printed. Since large manpower is required, this system is error-prone and is time consuming from a customer's point of view.

Introduction of Computers in Hospitality Industry:

The emergence of computers pioneered the automation of the food ordering system. A PC was set up where waiter after taking the orders would enter the order in the system. The information was then displayed at a screen in the kitchen. The kitchen staff would then prepare the dishes accordingly and on completion would notify the waiter who collected and delivered the dishes to the respective tables. The system was also capable of intimidating the waiter about the availability of a dish. If a certain dish was unavailable, the waiter was able to ask for changes or even delete a customer's order. After serving the food, the waiter used to generate the bill at the cash counter. All the details of the customer were fed into the system which the management had full access to.

With the advancement in the computer and communication technology, various systems were launched in market for the purpose of automation of the food ordering system. Some of them are mentioned below:

Q-order:

The next improvement in restaurant industry was 'QORDER'. The waiters now no longer took the orders on paper instead all the orders were taken on a handheld device called the 'QORDER'. It was a android device where the waiter enters order information on the touch screen and then sends it to the kitchen in for processing. Once the guests are done, the waiter prints the receipt out and processes payment with the handheld unit.

Multi-Touch Technology:

Multi-touch technology is an enhancement to the existing touch technology where users are allowed to control and

perform operations simultaneously on the electronic visual displays using gesture inputs. The term “Multi-Touch surface” refers to a surface that senses touch such that it has the power to identify the occurrence of more than two points of contact with the surface. Multi-touch technology is an advanced human-machine interaction technique that recognizes multiple touch points and also includes the hardware devices that implements it, which allows the users to interact without any conventional input devices but touch screens available in the market are of capacitive or resistive types which are very costly.

Personal Digital Assistants (Pda's):

When new technologies and approaches being introduced to automate the food ordering process a number of wireless systems like WOS, i-menu, FIWOS were developed. All these systems were PDA- based. When order making completes, these PDAs are to be collected by the waiters to be used by other customers. PDAs are small and portable devices. With wireless technology, the communication between the server and PDA is feasible. There was easy communication between the PDAs and server due to wireless technology.

But this system also had several drawbacks. PDA-based system increased the restaurants expenditures as a number of PDAs are required to serve the number of customers during peak hours. PDA systems also did not provide any real time feedback from customers; Menu cards in the PDAs were unattractive and uninformative as it did not support images.

III. METHODOLOGY

To overcome the limitation in PDA based system we proposed an automated food ordering system for restaurants with real time customer feedback (AOS-RTF). It is a wireless food ordering system using android devices.

Android smart phones attract both the general and commercial (i.e Business) users. Hence, considering the promising future of Android market, it is beneficial and worth to write applications for android that target masses of people.

Android devices (tablets and mobile phones) are extremely popular and have revolutionized the use of mobile technology in wireless environment. Android is a Linux based operating system for mobile devices such as smart-phones and tablets. The programs are primarily written in customized version of java by the developers, then the apps can be downloaded from online stores such as Google Play (formerly Android Market), the third-party sites or the app store run by Google.

Android smart phones have been viewed as essential devices to serve telemedicine services for various health problems, they are also used for home automation, design security applications and geographical applications.

Motivated by the use of Android mobile now-a-days, we present the use of Android Devices in the food ordering system in restaurants. The Objectives of our proposed system are:

- To combine Wireless technology and Android Mobile OS to automate food ordering process.
- To Eliminate or at-least minimize the flaws in conventional system by automating the Food ordering system in restaurants.
- To implement real-time feed-back between restaurant owner and customer about order status.

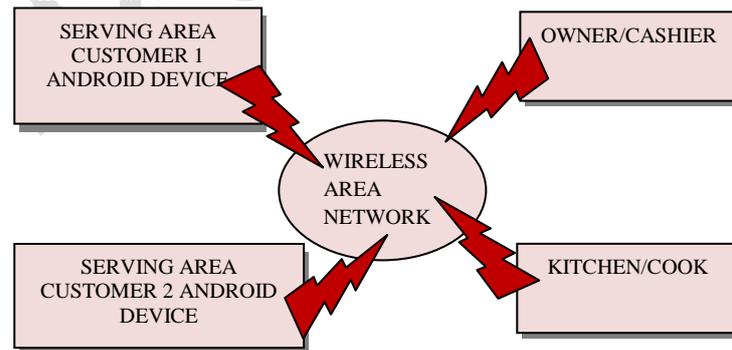
The AOS-RTF system:

A. System Architecture

The system architecture of AOS-RTF depicted covers the three main areas of restaurant:- the Serving area, the kitchen and Restaurant-Owners desk (Cashier table).

Conceptually the AOS-RTF is built using four main components:

1. The android application on android mobiles of customers to make orders.
2. The server and web applications on the restaurant-owner's laptop to customize menu and keep track of customer records.
3. The central database for restaurant-owner to store updated menu information and order details.
4. Wireless infrastructure to support networked communication.



The AOS-RTF Architecture

B. System Design

Firstly the restaurant owner will log into the system and update the menu and advertise the promotion strategies. The customer has to login the system so that the system can assign identification number to the ordered menu. The customer information and menu choices are sent to the system over wireless network. The restaurant owner and the kitchen staff will receive the ordered lists from the system. The restaurant owner can update the order status into the system. The customer can thus view his order status. After having the food customer can make payment and can enter feedback regarding restaurant system and services.

C. System Specifications –

The AOS-RTF system is designed using the JAVA programming language. We have used android technology to design the user interface. WI-FI is used to send information and to retrieve data from AOS-RTF.

CONCLUSION

In this paper, we present an automated food ordering system with-real time customer feedback (AOS-RTF). 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. Overall conclusion is that, this is a fabulous food ordering system for the restaurant sector, made by combining the Android and Wireless technology.

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