

# APPLICATION ON ORDER MANAGEMENT SYSTEM IN RESTAURANTS

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## ABSTRACT

*The rampant growth of mobile and wireless technology is making a large impact in our lives. Nowadays people are looking forward for an application that satisfies their needs even more comprehensively. Most of the restaurants industries are looking for any mobile application that enhances the dining experience as well as that increase the profit. 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. This application runs on devices such as tablets which provides convenience, improves efficiency and accuracy of restaurants by saving time and reducing human errors.*

**Keywords:** Wireless Food Ordering System, Touch technology, Android, Wi-Fi, Tablet.

## 1. INTRODUCTION

Businesses in hospitality industry based on food services have grown significantly in India. In the last few years where many restaurants have opted for offering various types of menus for the customers, this has increased the competition in the hospitality industry [1]. The restaurants have to provide the best services and maintain relationships with their customer in order to survive in this competition.

In any restaurant when a waiter takes an order from the customer he must write down the order on a piece of paper and then enter it into a computer. The order is then taken to the kitchen, the current system wastes a lot of time as the waiter keeps going to and from the customer. It also wastes a lot of paper since the order must be written down, printed out for the order to be given to the kitchen, and finally a paper receipt must be given to the customer.

With the upsurge in Information and Communication Technology, many industries use web as a medium of exchanging the information. To overcome the problems faced by the restaurants, a wireless application could be designed and implemented in any medium or large scale restaurant. The application is installed on each of the tablets; the customer selects the food from the menu provided to him and gives the order to the waiter. 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 a using such an application:

- Due to the tablets, the waiters need not leave the table to process the order.
- The waiters can spend more time in satisfying the customers and there will be no mixing of order.
- The waiter will know the availability of food, as messages can be sent from the kitchen to the waiter's tablet.
- Status of the ordered food can be checked at any time by the waiter as well as customer.

To overcome the above problems in a normal restaurant a Wireless Order Management System could be designed and implemented effectively.

## 2. LITERATURE REVIEW

### 2.1 Tablet

Tablets are a mobile computer mainly functioned by touching the screen instead of using a physical keyboard. A tablet features both a stylus as well as an on screen keyboard.

There are mainly two types of tablets, resistive (passive but high level of precision) and capacitive (less accurate but more responsive).

## 2.2 Background

Before developing any application, a comprehensive and systematic research needs to be done so as to target the market needs [6]. A number of wireless applications for restaurant ordering have been analyzed, developed and implemented in restaurants. These have been implemented using PDA's (Personal Digital Assistant), Windows Mobiles or Android Mobiles. Also many wireless technologies are available today. This application is developed specifically for medium and large scale restaurants using Wi-Fi (Wireless Fidelity) system and Android-4.0 as a working platform.

## 2.3 Related Work

A web based ordering system named CaptainPad [2], is the wireless technology solution for automating the ordering system in the hotels and restaurants. Using a Captain Pad, orders can be sent directly from the table to the kitchen, which ensures that customers receive their orders faster. Developers used MS Dos, Win 3.11, Win95, 98 and Win NT, WinXP, Linux operating systems, C, C++, Java, XML, HTML and Pl/Sql as programming language and web based technologies like (Java Servlets, JSP, EJB, HTML, XML, Struts, and Hibernate). They also used My Sql and Oracle 8 for databases and for web servers JBoss, Apache and Tomcat. The whole menu is loaded in the CaptainPad device. With the use of CaptainPad the overall efficiency increases.

# 3. TECHNOLOGY

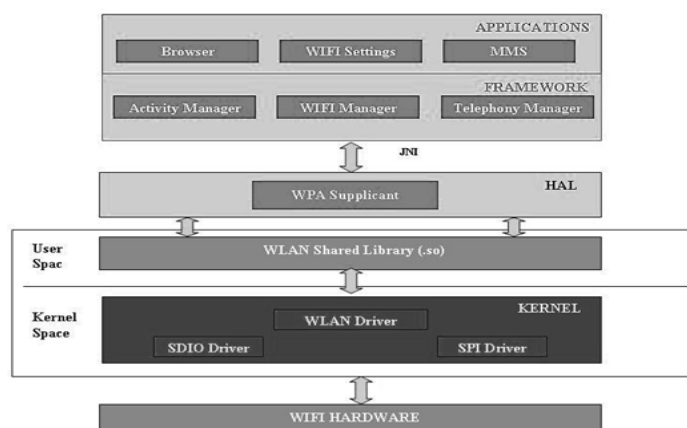
## 3.1 Multi-Touch Technology

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 [3].

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 [4]. Different applications for multi-touch interfaces exist and are being proposed e.g. iPhone, iPod touch, MacBook Pro, MacBook Air. The use of such devices is expected to rapidly become common after introduction of android.

## 3.2 Wi-Fi / WLAN architecture of Android

Figure. [1] shows the web architecture in android and the sequence of flow of information [5]. It shows how the user can connect or disconnect to the Wi-Fi network.



**Figure 1: Android Wi-Fi Architecture**

There are three main parts of Android Wi-Fi architecture. The first is the Wi-FiManager which is a service and a framework component. It is used by the application to inquiry about the Wi-Fi related functionality to the driver. It also manages the link connectivity and different networks. Second is the Wi-Fi Service which is also a framework

component. It is capable of managing Wi-Fi commands from various clients (applications) and executing the Wi-Fi commands to the driver using JNI (Java Native Interface) interface that has been provided. The third is the WPA (Wi-Fi Protected Access) Supplicant which is designed for implementing security methods like WPA, WPA2 and WEP (Wired Equivalent Privacy) and for key negotiation with the Wi-Fi driver. The Wi-Fi hardware is a Wi-Fi chip along with the kernel driver.

### 3.3 Wi-Fi over Bluetooth

There are many systems that have been implemented to automate the ordering systems at the restaurants. There are many techniques which can be used to implement such a system. Some of them use WLAN (Wireless Local Area Network) and Bluetooth.

Many of these have their own advantages and limitations. After studying all the prospects of the proposed system, this application is developed using WLAN, and not Bluetooth technology. Bluetooth and WLAN are two different modes of wireless communication. While Bluetooth technology is useful for communication between two or more devices that are near in close proximity to each other and where speed between two communicating devices is not a matter of importance. It is best suited for low-bandwidth systems for transferring files using mobile phones whereas Wi-Fi is best suited for large-scale networks. Wi-Fi provides better range, faster connection and better security than Bluetooth technology. While the frequency of both the technology is the same, bandwidth and bit-rate of Wi-Fi is way more than Bluetooth technology which is the reason Wi-Fi is used for faster sharing of information between two devices. Also range of Bluetooth (about 10 meters) is significantly less than that of Wi-Fi (mostly 100 meters in ideal situations).

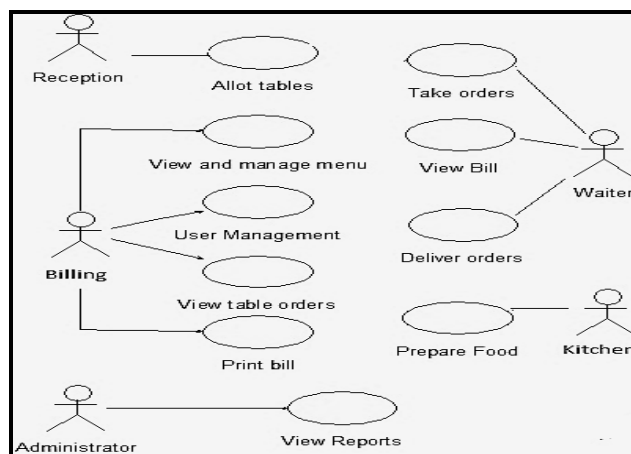
### 3.4 Tablets over PDA

Nowadays mobile users have many choices; they need to pick one carefully as each has a high price to be paid. One of the most important choices the restaurants have to face is whether to use a Tablet PC or a PDA if they want an order management system for their restaurants.

There are a lot of pros for using tablet in a restaurant's ordering system. The larger size of tablets is more comfortable as compared to PDAs, for a user who is accustomed to working on a laptop or desktop PC. Most of tablets are compatible with android. As Android is open source, there is no need to purchase additional software. A tablet has all the features that a PDA possesses providing the ability to work in full program. Tablets also have the capability to be used in a docking station so that one can utilize it with mouse and keyboard. A larger screen size is easy to read and more details are visible. On the other hand if PDAs are bought on a company-wide basis, then the users will have to purchase PDA's based on Windows OS or Palm OS. A small viewing area on PDAs can make reading long information dull and wearisome; it even reduces the quality of the text or image. In all, the user has a bad experience of viewing any sort of information on a PDA. With the use of Operating systems as Palm-OS or Windows OS, the PDAs have a high purchase cost over the tablets. Thus, this system is implemented using a Tablet with an Android operating system.

## 4. METHODOLOGY

Our main aim is to increase the efficiency of the food ordering system and reduce human errors and provide high quality services to the customers of the restaurants. The application on the tablets must be able to communicate wirelessly with the other devices. Figure [2] shows the use case diagram to illustrate the system plainly.



**Figure 2: Use Case Diagram**

- Firstly the person at the reception is empowered to allot the suitable of table(s) to the customers, via a tablet.
- Then as soon as the table is allotted, the customer is directed to his/her table with a steward waiting for them to take his order.
- The customer sees the categorized menu card in the digital form on the tablet.
- The waiter or waitress inputs the orders into the handheld tablets.
- The orders are sent to the kitchen via Wi-Fi. The kitchen staff sends a notification whether the food is available or not. The kitchen side can also send the progress report of the food to the waiter's tablet. When the kitchen staff sends a notification that the food has been prepared, the waiter in the kitchen serves the food at the respective table.
- If there is a need for modification in the food menu, the manager modifies the menu. The menu gets changed in the database. The changed menu then gets updated on the waiter's as well as on the customer's tablet.

## **5. CHALLENGES AND FUTURE SCOPE**

The system implements the following functions: the waiter takes order from the customer into his tablet, the customer can visualize the order and bill, administrator has the authority to change the menu and has authority to view daily, weekly or monthly report on profits and lastly the kitchen staff can prepare and serve the order.

Apart from these functions there are some limitations in this system like Provisions have to be made to accept different types of payment like credit cards, debit cards, checks, tips, donations etc. More features could be added like online booking of tables and ordering of food items.

There can be a provision that accepts feedback from the customers and a registration form so that next time the customer can order his previously ordered food item.

## **6. CONCLUSION**

The wireless ordering system has egressed progressively and revolutionized the restaurant business industry and other fields. This system is convenient, easy and effective thereby improving the restaurant staff's works performance besides providing quality of service and customer satisfaction. This system has addressed many hindrances in food ordering process and management of restaurants by lessening the time of customer and management for ordering of food and cost for the pen and papers. This system provides pleasure to customers for making orders and management can meliorate their management.

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