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Automated Table Ordering System

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ABSTRACT

At present, information and communication technology has been brought to a number of businesses in order to make the operations more convenient adding to their values. Restaurant management can be more efficient with the help of technology. Both the owner and the customer will find it more convenient and hence values will be added from the good impression and the efficient administration and management of the entrepreneurs. As living standards improved, people not only focus on good diet but also on the dining environment and home deliveries. In addition, the management of traditional hotels is a relatively low level wherein all the operations are basically carried out by hand, the time taken by the waiter for taking orders is long, and the waiter rushes about with leaflets and high error probability. Also, while taking home delivery orders, there can be mistakes done in a similar way while noting the orders. Today, hospitality and services have a great impact on the business. On this basis, the automated food ordering system came with the tide of fashion. The orders from the customer's table are sent directly to the kitchen as well as updated in the central database. Due to the tablets the waiter does not need to leave the tables to process the orders, they can spend more time in satisfying and grooming the customers, there won't be any issues of orders being mixed, waiters will know the availability of the food as the messages will be sent to the waiter's table from the kitchen, status of the ordered food can be checked at any time by the waiter as well as the customer. Plus, there will be an online version available for home delivery of food. All these goals can be achieved by this proposed system.

Keyword: Restaurant, Owner, Customer, Order, Billing.

1. INTRODUCTION

Nowadays, Digital multi-touch menu cards in the restaurant are replacing traditional services where waiters take order from customer according to their menu requirements. In traditional restaurants, orders are taken by waiters and they bring the food when it is ready, later the customers pay the bill to the waiter or to the accountant at the Reception area. Also, home delivery orders are noted down on paper and can even contain errors in the address noted. This system relies on large numbers of manpower to handle customer reservation, ordering of food, placing of order on the respective table, reminding orders of the customer, delivering of food and billing. Therefore, ways to effectively improve the service quality for customers by using advanced technologies has received much attention in recent years. Restaurants only provide passive services where the waiter can only deal with customer's order by asking customer's requirements, transferring the order to kitchen and finally cash counter. In a medium to the large and busy restaurant, this coordination is a challenge and requires an efficient ordering system. Errors in ordering processes lead to incorrect or out of sequence meal preparation and results in added cost to the business. This project aims to deliver automated table ordering system with the home delivery feature. Herein, in the hotel, the order will be placed digitally through touch screen module i.e the tablet. This order will be communicated through a wireless medium to the kitchen as well as will be updated in the central database. This similar display will be present in the kitchen and according to the customer's order, the catering staff will prepare the food. Once the order is ready in the kitchen, the waiter will be notified about it being ready to be served. As for the online version, the order can be placed directly through the customer's mobile, which will be placed in the cart. Then this order will be delivered to the customer in a specific amount of time. It's all about getting all of your different

touch-points working together—connections, sharing of information, personalizing experiences and speeding processes.

1.1 Existing System

The traditional paper based system is one of the most extensively used systems worldwide. In this system, all records are stored on paper. However, this system is plagued with various problems. Some of the problems are highlighted below:

- The most common blunder is waiters making mistakes with customer's orders. At times, a waiter can forget to add a specific item, make changes because a customer is allergic to the certain substance, or forget to give the order to the kitchen.
- Customers have to wait for a waiter to take their order. They must rely on the waiter to remember their order and specific details. Their food may take longer to be prepared and served if the waiter has multiple tables. They may also get wrong bills since they cannot see their bill amount until their meal is complete.
- Impatient customers also call over the waiter/waitress frequently to find out the status of their order several times during their visit, wasting the waiter's service time.
- Waiters need to constantly check with the chefs to determine when food is ready. Conversely, the chef needs to make sure waiters know that food is ready. This can cause the food to get cold over time and lead to potential food poisoning. It may also lead to wrong orders and an unsatisfied customer.
- Keeping track of empty, clean and reserved tables within a restaurant.
- Waiters must always be alert as to which tables need clearing. This means that they must be always checking for tables. Waiters need to usually alert them. This takes extra time from other staff.
- Also, for a home delivery order, there are chances that the order is taken down incorrectly or even the address in sometimes insufficient or unknown.
- Managers have to analyze hundreds of paper receipts to determine best-selling items, popular hours and customer satisfaction. They also require reprinting of menus when food is not available or a price needs to be changed. This can be costly and time-consuming to a restaurant.

1.2 Proposed System

The above mentioned traditional menu ordering systems are time-consuming and susceptible to human errors which can only be reduced, not completely eliminated. The problem with the self-service ordering system is that self-service restaurants are more popular in metro cities. Comparatively, in smaller cities, there are hardly any self-service restaurants available. Comparatively self-service systems are very rarely found in small cities. Our aim is to develop a cost-effective system which can work affordable in smaller restaurants too. This system aims at creating a user-friendly interface, service navigation, and low cost, increasing service range of wireless communication used and decreasing the order processing time, reducing the paperwork and the human errors in it. As a remedy for the traditional systems, we propose a restaurant with a touch technology system. Our system aims at providing the following features:

- Combining of Wireless technology and Android OS to automate food ordering process.
- Allow the restaurant to operate faster (faster seating, faster order preparation, faster turnaround on food).
- Reduce employee error, thereby increasing customer happiness. This also reduces waste as when the wrong item is ordered, the food must be discarded.
- To minimize the flaws in a conventional system by atomizing the working of a restaurant.
- To provide a mechanism for obtaining feedback from the customers and provide the restaurant a means of review of their service.

2. Background Study and Literature Review

2.1 Tablet

A tablet computer, commonly shortened to the tablet, is a thin, flat mobile computer with a touchscreen display, which in 2016 is usually color, processing circuitry, and a rechargeable battery in a single device. Tablets often come equipped with sensors, including digital cameras, a microphone, and an accelerometer. The touchscreen display uses the recognition of finger or stylus gestures to replace the mouse, trackpad and keyboard used in laptops. They usually feature on-screen, pop-up virtual keyboards for typing and inputting commands. Tablets may have physical buttons for basic features such as speaker volume and power, and ports for plugging in network communications, headphones and battery charging.

2.2 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 on 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 intimating 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 the market for the purpose of automation of the food ordering system. Some of the existing systems are mentioned below:

- **Personal digital assistants(PDAs)**

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. The feature of PDA systems was that customers or waiters key in the ordering process. There was easy communication between the PDA's and server due to wireless technology.

But this system also had several drawbacks. PDA-based system increased the restaurant's expenditures as many PDA's were required during peak hours. PDA systems also did not provide any real-time feedback from customers. Menu cards in the PDA's were unattractive and uninformative as it did not support images.

3. System Architecture

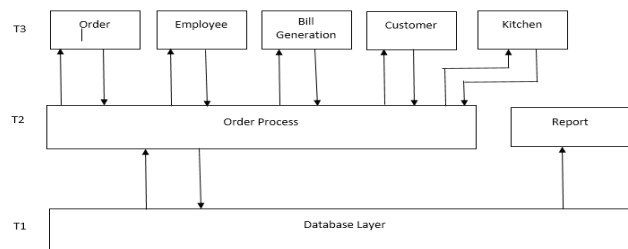


Fig: System Architecture

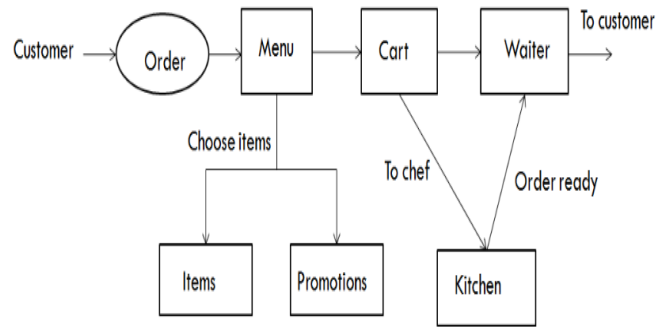
- The architecture covers the four main modules: the Customer or the Foodie, the Manager, the Administrator and the Kitchen section. Conceptually this system is built using four main components:
- The android application on the smartphones.
- The server application on the restaurant manager's laptop/tablet to customize keep track of customer records, table bookings and time required to reach.
- The central database for restaurant-owner to store updated menu information and order details.
- Wireless connectivity between the manager and the kitchen area of the restaurant.

3.1. Modules

The main modules of this project are as follows

3.1.1. Tablets at the customer's table: (module 1)

- These tablets are designed for the use of normal users arriving at the restaurant.
- These tablets display the whole menu of the restaurant. The menu contains text and graphics that describe each item to an average customer. The items in the menu are non-editable for these types of the tablets.
- They will work efficiently by enabling Wi-Fi connectivity.
The customer can view the menu of the restaurant and add menu items to cart, see the total price, specify the quantity and add notes (e.g. "no onions", or "less garlic"). The menu also displays a brief description of the item when selected.
- Customers can also go through the features of the restaurant, take a look at the facilities provided by the restaurant and check for various offers available.
- When the desired list of dishes is finally selected, the customer can click on „Confirm Order“. This order is then sent to the chef via the kitchen display and to the cashier's desk as well.
- The tablet also provides a feature for providing real-time feedback.



3.1.2. Manager Desktop/tablet (module 2)

- These desktops cater to the needs of the restaurant manager.
- The manager controls the functioning of the whole restaurant from a single desktop/tablet.
- He is authorized to access any tablet and is provided the authority to make changes to the menu.
- He can perform various updates like changing the price of a particular item or disabling a particular item which is not available at that particular time.

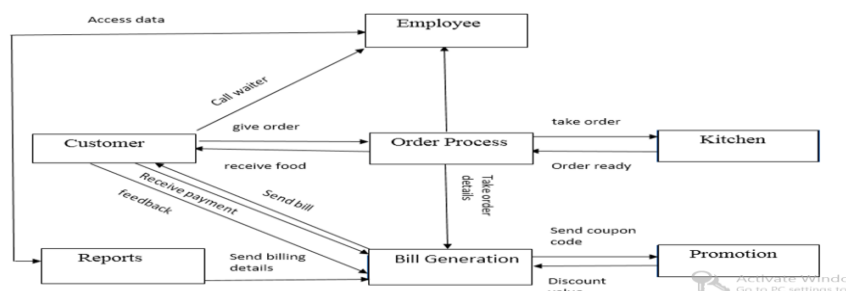
3.1.3. Kitchen Display Interfaces (module 3)

- These displays are set up in the kitchen near chef so that he is able to view the orders requested from the customer.
- All the ordered items along with their table numbers are displayed punctually at the chef's interface.
- The resolution and font size is sufficiently large to be seen by the chef at a reasonable distance.
- The display allows the chef to update the estimated time of completion of each order once he starts cooking it.
- The chef's screen displays two-three orders simultaneously which updates the chef about what to expect once the current order is closed.
- The chef is able to notify and close an order when a particular item is ready.

4. System flow

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. Fig. shows the dining section that is a waiter with mobile placing an order. Fig. shows kitchen and cashier section. And Fig. shows a flow chart of the system. Firstly the person at the reception is empowered to allow the suitable of the table(s) to the customers.

- The customer sees the categorized menu card on the table.
- The waiter or waitress inputs the orders into the handheld android device. The orders are sent to the kitchen via Wi-Fi.
- The kitchen staff sends a notification whether the food is available or not.
- 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 android device



CONCLUSIONS

- The proposed system would attract customers and also adds to the efficiency of maintaining the restaurant's ordering and billing sections.
- 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.
- Food ordering system with features of feedback and wireless communication. This system is convenient, effective and easy thereby improving the performance of restaurants staff. This system also ensures good quality of service and customer satisfaction.

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