Automated Food Ordering System

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Abstract -- The growing number of restaurants and population of restaurant-goers have emphasized the need to enhance the working of hospitality industry. This research work aims at improving the quality of services and business of the hospitality industry by incorporating technology. A detailed research on the integration and utilization of technology in hospitality industries showcased that various applications based on wireless technologies are already in use enabling partial automation of the food ordering process. In this paper, we discuss about the integration of touch technology in restaurants using android. This system is a basic dynamic database utility system which fetches all information from a centralized database. The tablet at the customer table contains the android application with all the restaurant and menu details. The customer tablet, kitchen display and the cashier counter connects directly with each other through Wi-Fi. 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.

Index Terms— Android Application,Automated food-ordering system,Dynamic Database,Touch technology, Wi-Fi.

1 INTRODUCTION

Data Mining is the computing process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics and database systems. An essential process where intelligent methods are applied to extract data patterns. It is an interdisciplinary subfield of computer science. The overall goal of the data mining process is to extract information from a data set and transform it into an understandable structure for further use.

Data Mining is formally defined as the non-trivial process of identifying valid, novel, potentially useful and ultimately understandable patterns in data. The field of data mining has been growing rapidly due to its broad applicability, achievements, scientific progress and understanding. A number of data mining applications have been successfully implemented in various domains like fraud detection, retail, health care, finance, risk analysis etc. In this busy world no one prefers to wait for long time in restaurant. It takes a lot of time for the process of ordering the food than waiting for food in the queue. Hence, to reduce the amount of time getting wasted for the ordering process we have planned to create an android application.

2 LITERATURE REVIEW

2.1 Traditional paper-based systems :

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 a changes because a customer is allergic to certain substance, or forget to give the order to the kitchen.
- 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.
- 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.
- Waiters need to constantly check with the chefs to determine when food is ready. Conversely, chef needs to make sure waiters know that food is ready.
- Managers have to analyze hundreds of paper receipts to determine best-selling items, popular hours and customer satisfaction. They also require re-printing of menus when food is not available or a price needs to be changed. This can be costly and time-consuming to a restaurant.

2.2 Computers usage in hospitality industry :

The emergence of computers pioneered the automation of the food ordering system. A PC connection was established where the waiter after taking the orders would enter the order in the system. The respective orders taken were then displayed at a screen in the kitchen. The kitchen staff prepared the dishes accordingly and on completion notified the waiter who collected and delivered the dishes to the respective tables. After serving the food, bill was generated at the cash counter. All the details entered by the customer were fed into the system which the management had full access to.

2.3 QORDER :

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The next improvement in the food industry was the "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 portable android device where the waiter enters order information on touch screen and then sends it to the kitchen for processing.

Simultaneously, the POS system receives the sales information for later billing. QORDER utilizes WI-FI to easily reach to the most remote corner spot in the restaurant. Once the guests are done, the waiter prints the receipt out and processes payment with the handheld unit.

2.4 Personal Digital Assistants (PDA's):

With new technologies and approaches being introduced to automate the food ordering process, a number of wireless systems like I-menu, FIWOS, WOS were developed. All these systems were PDA- based. The feature of PDA systems was that customers or waiters key in ordering process. Communication between the PDA's and server became feasible and simple due to wireless technology. But this system also had several drawbacks. PDA-based systems surpluses the restaurant 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 PROPOSED WORK

To overcome the limitations of above systems, we propose this integration of touch technology in restaurants based on android technology. The system architecture of Touch and Order in restaurants is shown in Fig.4.3[1].

The architecture attempts at a full coverage of the three main areas of restaurant: the Serving area, the Kitchen, and the Manager counter. The main components of this system are:

1. The android application with the customers allow them to directly view the menu card and order immediately.
2. The server application on the restaurant-owner's desktop/tablet to customize menu and keep track of customer records.
3. The central database for restaurant-owner to store updated menu information, order details and broadcast various offers and promotions.
4. Wireless connectivity between the three main areas of restaurant.

This proposed system has following modules :

3.1 Android app with customer :

This app is designed for the use of normal users arriving at the restaurant. It displays 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. 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 total price, specify quantity. The menu also displays a brief description of the item when selected. When the desired list of dishes is finally selected, customer can click on "Confirm Order" as shown in Fig.4.1.

3.2 Manager Desktop/tablet :

The manager controls the functioning of whole restaurant from a single desktop/tablet. He is provided the authority to make changes to the menu. He can perform various updates like changing the price of a particular item disabling an item which is not available at that particular time. He is able to view the orders requested from customer. All the ordered items are displayed punctually at his interface. Manager sends the order details to the chef. Once the food is ready he is responsible for reducing the amount of ingredients used for that particular food. Hence, he can keep track of amount of food that is sold and the quantity of ingredients used in each food items. Based on this result, he can come to the conclusion about which food is more preferred in that particular region/season. Manager can also calculate profit or loss on the daily or weekly basis.

Once the manager sends the order details, chef prepares the food. He then sends the food through the waiter to the customers as shown in Fig.4.2.

3.3 Rating :

Once the waiter serves the food to the customer, he will be given an option to provide the rating for the food and services provided by the restaurant.

4 SYSTEM DESIGN

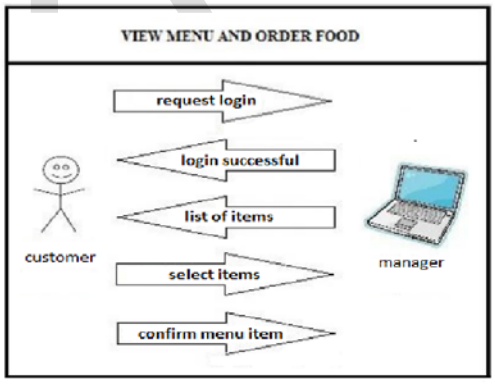

Fig.4.1 System Sequence Design for View Menu and Order food

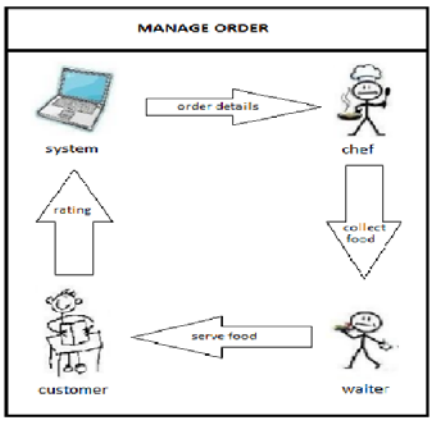

Fig.4.2 System Sequence Design for View Menu and Order food

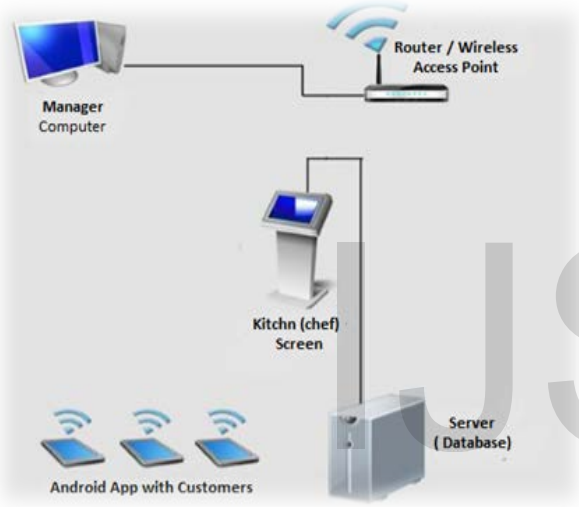

Fig.4.3 System Architecture

8 Conclusion

In this paper, we compare the major automaton tools in Restaurant sector namely, the PDA based System, QORDER system and Android based system. The GUI of Android applications are more attractive and informative than the PDA and QORDER systems. The processing speed of Android system and QORDER system is almost the same whereas the PDA based systems are slower than the other two systems. Therefore, it is clearly visible that Android based systems are the cheapest automation solution for the restaurant owners.

Thus, we present an automated food ordering system with features of feedback and wireless communication. This system is convenient, effective and easy thereby improving the performance of restaurant's staff. This system also ensures good quality of service and customer satisfaction. Thus, the proposed system has the potential to attract customers and also adds to the efficiency of maintaining the restaurant's ordering and billing sections. It also helps the management to calculate quantity of food sold and also amount of ingredients used. Manager can also calculate profit or loss on the daily or weekly basis.

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