

Proposed Automated Food Ordering System Using Data Mining Techniques

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Abstract— 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. In this paper, an automated food ordering system is proposed which will keep track of user orders smartly. Basically we are going to implement food ordering system for different type of restaurants in which user will make order or make custom food by one click only. The implementation of this system will be done using android application for Tablet PC's. The front end will be developed using JAVA, Android and at the backend MySQL database will be used.

Index Terms— Android Application, Cluster, Data Mining Techniques, Frequent Item Sets, Wireless food ordering system.

I. INTRODUCTION

The basic problem in the food service industry is that restaurants are not realizing efficiencies that would result from better applications of technology in their daily operations. The earlier food ordering system was entirely a manual process which involved waiters, pen and paper. The waiter had to note down orders from customers, take these orders to kitchen, update them in records and again make bill. Even though this system is simple it may involve human errors in noting down the orders. There are many reasons leading to the feeling of dissatisfaction including being entertained late in terms of order taking by the waiter and meals serving. To overcome these limitations in manual system, multi-touchable restaurant management system is proposed in this paper to automate food ordering process.

The food restaurant with automated food ordering system will be equipped with a user-friendly touch screen, display screen in the kitchen, and software for completing the process at the backend. For this system there will be a system administrator who will have the rights to enter the menu with their current prevailing prices. The system administrator can enter anytime in the system by a secured system password to change the menu contents by adding or deleting an item or changing its price.

Now when the customer enters the restaurant, customer will place his order with the help of the touch screen using the intuitive graphical user interface, right from the selection of menu items, confirming the order and viewing offers. The customer will select from the food options according to his choice and the system will display the payment amount customer has to make once finished with the order.

II. PREVIOUSLY WORK DONE

In [3] 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.

Also in [4] paper they done a research work aims to design and develop a wireless food ordering system in the restaurant. The project presents in-depth on the technical operation of the Wireless Ordering System (WOS) including systems architecture, function, limitations and recommendations. It is believed that with the increasing use of handheld device e.g. PDAs in restaurants, pervasive application will become an important tool for restaurants to improve the management aspect by utilizing PDAs to coordinate food ordering could increase efficiency for restaurants and caterers by saving time, reducing human errors and by providing higher quality customer service. With the combination of simple design and readily available emerging communications technologies, it can be concluded that this system is an attractive solution for the hospitality industry.

III. PROPOSED SYSTEM ARCHITECTURE AND ALGORITHMS

In this system customer orders the food by using android based touchpad. Figure shows the system architecture, which cover three main areas of the restaurant: the serving area, the restaurant owner's working desk (cashier table), and the kitchen. Customer first

orders the food from the touchpad looking at various combination of food which is further carried to the kitchen for fulfilling the order and the same is passed for billing at the each customer's tablet.

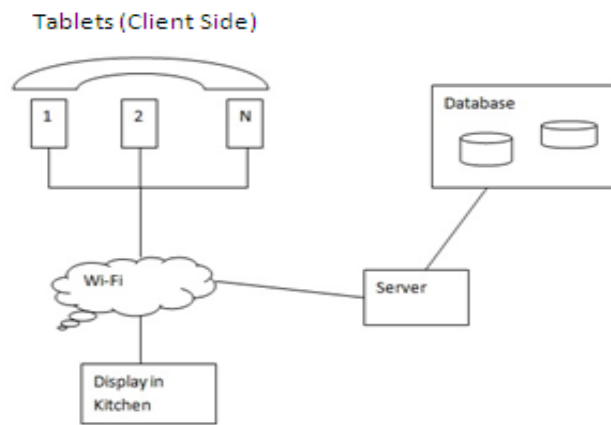


Fig 1 System Architecture

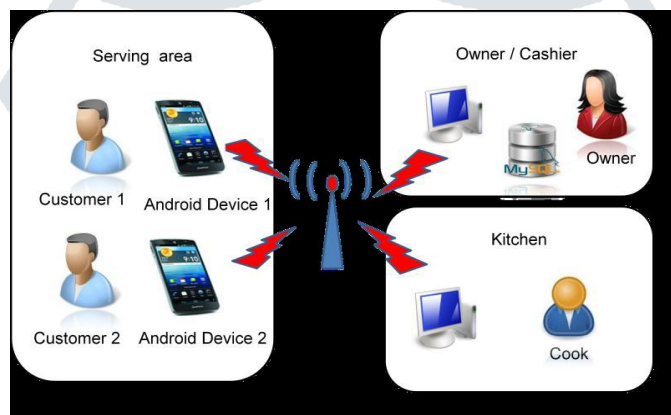


Fig 2 Working of Proposed System

A] Algorithms

i) K-means Clustering

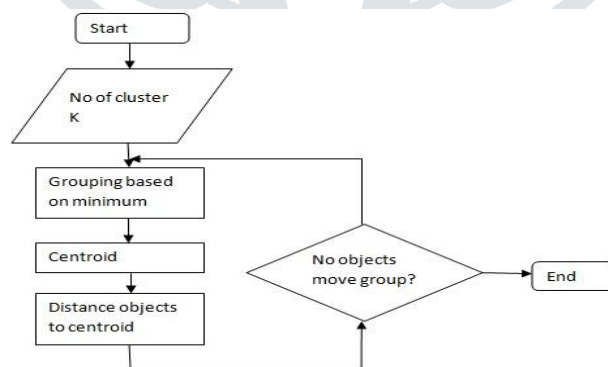


Fig 3 Flow of K-means Clustering

This is an algorithm to classify or to group your objects based on attributes/features into K number of group. K is positive integer number. The grouping is done by minimizing the sum of squares of distances between data and the corresponding cluster centroid. Thus, the purpose of K-mean clustering is to classify the data.

ii) Apriori Algorithm

Association rule generation is usually split up into two separate steps:

1. First, minimum support is applied to find all *frequent itemsets* in a database.

2. Second, these frequent itemsets and the minimum confidence constraint are used to form rules.

Apriori uses breadth-first search and a tree structure to count candidate item sets efficiently. It generates candidate item sets of length k from item sets of length $k - 1$. Then it prunes the candidates which have an infrequent sub pattern. According to the downward closure lemma, the candidate set contains all frequent k -length item sets. After that, it scans the transaction database to determine frequent item sets among the candidates.

IV. FUTURE SCOPE

In future, work can be done on providing provisions to accept different types of payments like credit cards, debit cards, tips, etc. The system can be further extended to register and link multiple restaurants to enhance the dining experience of customers.

V. PROPOSED SYSTEM

The implementation of such type of proposed automated system will minimize the number of employees at the back of the counter. Also the system will help to reduce the cost of labor. As there are lots of orders at the restaurants, there is possibility of human errors during calculations or taking orders. By using this system, such type of errors can be eliminated and controlled up to some level. Addition to this, the proposed system will avoid long queues at the counter due to the speed of execution and efficient management. The another advantage of the automated food ordering system is that the system will be available 24 hours for 365 days, because the machine is not going to take any sick or vacation leave. The proposed system will have an admin module which will help the restaurant owner to get the required analysis. Data mining techniques like apriori, k-means are used to perform association mining and clustering operation.

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