INTEGRATED RESTAURANT SERVICE USING POS SYSTEM

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ABSTRACT

Over the last few years, the evolution of Information Technology is rapidly increasing and most of the technologies have served Smart Business solutions. These innovative technologies have a huge impact on the external business environment like Business to the Customer level. Some studies on these smart technologies in restaurants showcased that several applications is already in use with partial automation. Hence, in order to make an advancement in these technologies and to reduce the difficulties in organizing and manipulating food order details and billing in the restaurants, a POS system can be developed which is integrated with several services that are needed in the restaurant. This system can drastically improve the service efficiency and lower the operating cost of the restaurant at the same time.

1. INTRODUCTION

Restaurants are currently looking for employing a technology that will help them to run their restaurant productively. Managing and dealing with the orders and generating reports for daily analysis of your restaurant isn’t the least bit a simple task. By completing things exactly instead, still, manual ways fail in comparison to the machine-controlled process of daily restaurant tasks. So, the entire restaurant operations can be made automated and it can enable the restaurants to broaden their reach and push their limits. By developing an integrated restaurant ordering system, we can make these things happen. The integrated restaurant service system is a technology in which the customers can directly make a food order request to the kitchen staff and they can respond to their request easily. Once the orders are placed, the bill amount can also be automatically generated easily by integrating it with another service. This whole system comprises of three major modules, Customer Facing Display (CFD), Kitchen Display System (KDS) and Point of Sale (POS) Billing System each with their very own functionalities. This paper provides a short introduction to the Integrated Restaurant Service System and each of its major modules. Besides, explaining the major modules we are also going to provide some details about the working model which is made using Java Swing and JDBC and then we are going to discuss the benefits of them over the recent system.

2. PROPOSED METHOD

In some existing systems, the system uses separate services or technologies for each function like ordering, billing, etc., so all the modules and services can be grouped together and end up with an Integrated Restaurant Service System.
The following flow chart explains the different modules that are integrated together into a single service.

![Flow Chart](image)

**a. Customer Facing Display**

The Customer Facing Display is a technology used in restaurants that are void of waiters and enables the customer to place self-orders in a mobile or tablet POS handed to them or placed in each table and it provides two types of services, displays menu book for food ordering and generates the bill after closing the order and also we can select the mode of payment which we are going to do. The customers can be able to view the whole digital menu of the restaurant with some additional information like best seller and Chef’s recommendations.

The advantages of Customer Facing Displays over the old systems are that the customers can place and edit their orders of their own and needn’t wait for the waiter to do it. It also allows the customers to view how the food may look like and also can see the ingredients used and the recipe preparing methods. It also displays some things like Chef’s recommendations and Bestsellers alike they are ordering foods online which will give users a very good experience and also it allows the customers to know the bill amount while they are ordering the foods.

**Figure 1 - Customer Facing Display**

**b. Kitchen Display Systems**

Kitchen display system is a task managing technology in which the foods that are ordered in a mobile or tablet POS systems directly by the customers in the restaurant table during the CFD phase are automatically sent to the kitchen and projected on a wide display, so that the kitchen supervisor can easily manage the orders by distributing the works to different chef’s or cooks. The kitchen supervisor can either accept or reject an order based on the stock condition. Once the kitchen supervisor accepts the order, it is automatically added to the pending orders section and once they are ready to serve, the orders are discarded and added to the finished orders section.

The advantages of the Kitchen Display System over the existing systems are that they reduce labor effort and the chances of manual error by automating the entire process. The changes in the order are automatically updated to the Kitchen supervisor as soon as they are requested by the customer. The management can keep a check on the average time taken for delivering a particular meal and can make improvements to it. The use of a Kitchen Display
System can drastically increase the food order and service time.

Figure 2 – Kitchen Display System

c. POS Billing System

The Point Of Sale Billing is a technology in which the billing can be done in a POS device instead of doing manual billing and they can be connected to a remote database that contains the food order details of each table which is added during the CFD phase and can generate the bill based on it. Once the customers close their order, the bills will be automatically generated and the customers can pay the bill either through online using the QR codes in the POS device or through the cash counter by cash.

The customers can generate the bill as soon as they placed the order (The order must be accepted by the Kitchen supervisor to generate the bill). Since they are not dependent on other services and only the database is needed to calculate the bill, multiple bills can be generated at the same time with multiple hardware variants. The restaurant management can generate a daily report easily from the database and can analyze the order information. The risk of manual bill manipulation of the employees is done away with.

Figure 3 – POS Billing System

d. Design and working of the model:

The front end user interface for all the modules in the working model is developed using Java Swing and the data that are received as user input are parsed and manipulated in the back end using Java program and then they are sent (during food ordering) and received (during bill calculation) to and from the database by connecting them using Java Database Connectivity. But, all these technologies must work together and needs to create a level of abstraction to provide the best user experience.

The following flowchart explains the working of our Integrated Restaurant Service System model.
In this system, the Customer Facing Display accepts orders from the users and they are brought back and saved into the database by JDBC. Then, the table in the Kitchen Order Display is updated by adding the placed order to the pending orders list and once they are finished, they can be added to the finished orders section by using a different query. Each table in the restaurant can have separate tables in the database to make billing and some other things effective. Once the customer closes their order, the data can be obtained from the database tables to the POS Billing System and then the bill can be generated. Since all the modules are integrated, these things work as a whole and make works easier.

3. RESULTS AND DISCUSSION

In most of the restaurant service systems, they have captains or waiters to take the order in a single POS mobile device and then he sends them to the Kitchen Display System to get the orders which may look better, but it doesn’t make a huge impact on customers. Instead of doing this, the Customer Facing Display technology can be introduced by which the customers can directly make their orders and make an edit on the orders if they want. The manual billing would be inaccurate and a customer check survey conducted for analyzing manual billing mistakes revealed that the manual billing was inaccurate 16% of the time and they can be resolved by using a POS system and they can increase revenue up to 1.5%. The POS systems can provide information on a real-time basis to the restaurant by the report, so they can quickly spot and react to the problematic areas which are affecting the restaurant’s profit such as declining orders in peak hours due to stock imbalance, excessive labor hours in the kitchen, etc.

The Integrated Restaurant Service System can be made to work with a remote server if the user can’t afford a server. But, if they are internet-based the whole system may shut down, if the connection goes offline.

So, it is better to get a small server to make things reliable. In most of the old systems, the services are done by separate modules. But to make things better, these services can be grouped to get a well Integrated Restaurant Service System.

4. CONCLUSION

In this paper, a comparison is made on some old automation tools used in restaurants and explained how the proposed system can perform better than the existing system. These technologies are always evolving and the best thing is that the food industry fetches the utmost edges out of it. The Point of Sale systems is the biggest evidence in regard to the advancement in the food business. Thus, by making the proposed system more advanced and efficient by considering all sorts of restaurant and customer's needs, it can be able to build an enormous distinction within the food business than ever before.

REFERENCES


