Android Tablet based Menu and Order Management System for restaurants

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Abstract

The traditional way of taking order services in a restaurant is that, once the customer selects the food and beverages from a paper menu, the waiter uses a pen and paper to take the order. Then the waiter gives the order to the kitchen and the customer has to wait until the order is received. This process is unsatisfactory, low efficient and contain mistakes. The customer may have to wait for a long time until he receives the order. During peak times the waiting time will be much longer. In another situation the waiter might have lost the paper or the waiter's hand writing might be difficult to understand by other people. This may cause the kitchen and the cashier mess up the orders and also may cause calculation errors. On the other hand, the paper menu can be hard to navigate and may be outdated. When the menu has a large number of menu items it makes the menu appear overwhelming to look through. Because of that, customers may not see all the items that they are interested in. When changes in price or item updates are required for the menu, the costs for reprinting and environmental concerns associated with reprinting need to be considered.

Several order service systems that were implemented were studied. Some of them had attractive features, but the user interaction and friendliness of such systems were not satisfactory. These studied systems were analyzed and the attractive features for the order service were identified. These features were implemented such that they are user-friendly.

The main objective of this work was to develop a tablet based restaurant menu and order management system to automate the manual order service system and to overcome the drawbacks of the studied systems. This implemented system contains four systems, a mobile application for customers and three web based systems for the admin panel, kitchen and cashier. The order is taken by a mobile device namely, a tablet placed on the restaurant table which acts as a waiter. The mobile application is started by a waiter, logging into the system and assigning the table number and a waiter identification. The waiter identification and table number are saved in the application until that particular waiter logs out. The mobile application has four subsystems namely, display subsystem, assistance subsystem, commenting subsystem and ordering subsystem. The display subsystem displays the complete restaurant menu by categories, special offers' information and allows the customer to browse all the currently available menu items by category. The assistance subsystem allows the customer to call a waiter 2 for any assistance needed. The commenting subsystem allows customers to create user accounts for adding comments and share experience on Facebook/Twitter. The ordering subsystem allows to select the desired items and make the order.

Once the customer makes the order, first he will be able to view the order information that he has ordered including the payment with/without tax and service charge. After the customer confirms the order, the order is transmitted to the kitchen department via Internet for meal preparation. The kitchen web system displays all order information that are received from the tablets. This include the customer details, table number, the waiter identification and the details of the order. After the order is prepared, the waiter will deliver the order to the customer. At the same time, the cashier web system receives the details of the delivered order and the bill is prepared. The web based admin panel system allows the restaurant's management to add/view/remove/ update menu items and waiters, view reservation information and their cooking status/payment status, update service charge/tax, viewing revenue information over a time period.
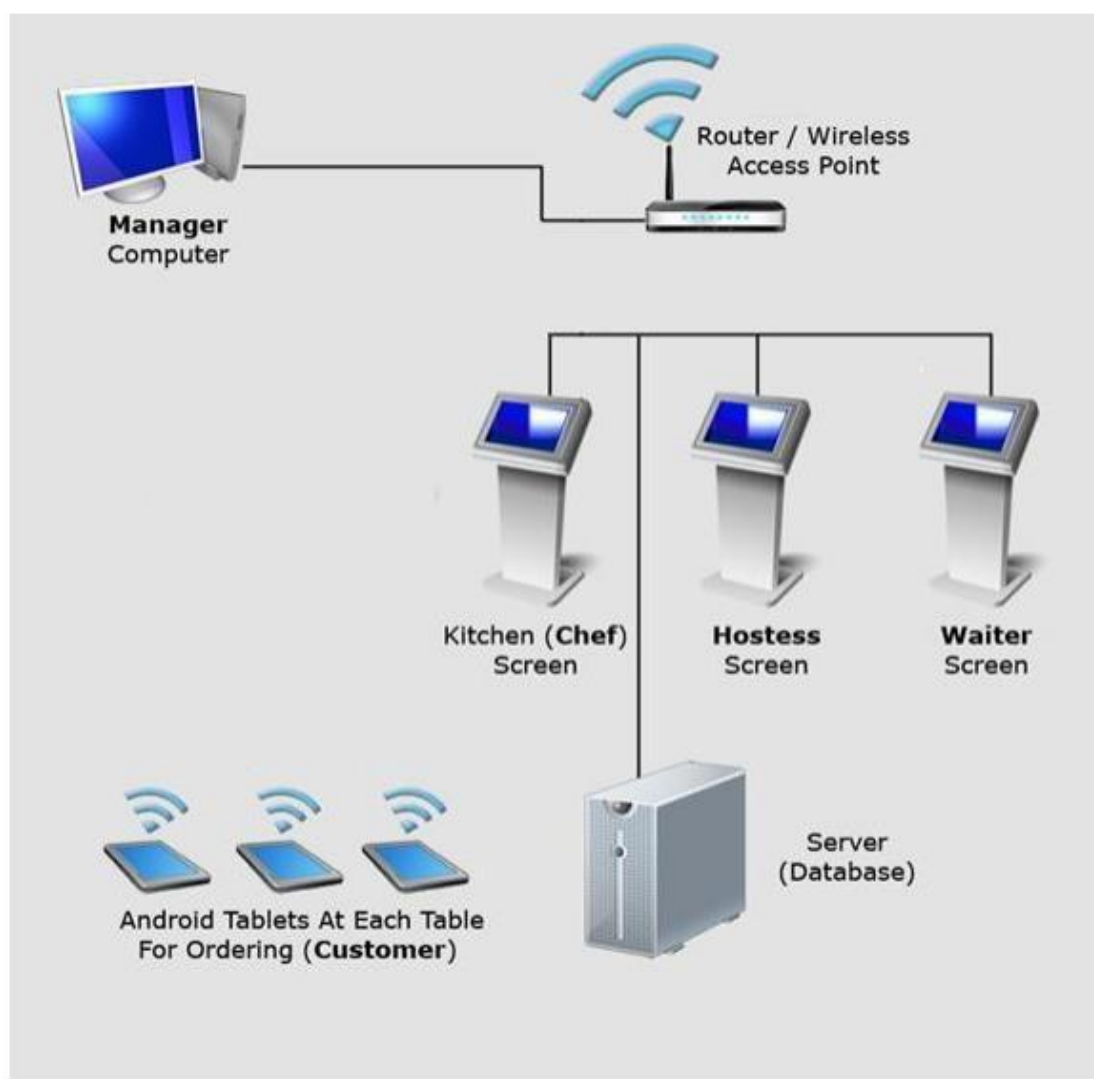

Figure 1: Architecture of the System

The produced design artifacts in this work have covered design concerns including architecture, application behavior and user interface. Figure 1 shows the architecture of the system. The implemented system consists of the server and a central database. The restaurant managers can

access the database using admin panel to make appropriate redeployments for food materials and evaluate the business status at any time. All ordering and expenditure information is stored in a database. This system is designed to be used on android tablets (screen size-7"). It can also be used on smart phones with smaller screen sizes. It is compatible with versions 2.3 and later. Eclipse and phpStorm were used as the IDEs. Mainly used languages are HTML, JavaScript, PHP, JAVA, XML. The system uses PHP to create web service to return JSON data with the 3 server. This implemented system adopted different testing approaches to test the prototype software and discovered bugs during these testing was corrected.

This system provides a more convenient, more maintainable, user-friendliness and accurate method for restaurant management. Other than that, the tablet based menu replace the paper waste, reduce the waiting time and increase the efficiency of the food and beverages order service system. By using this system, the restaurant can reduce the running cost, human errors and provide high quality service as well as enhancing customer relationship.

As future development, features such as paying the bill directly through the menu application should be created. In addition, this application will be developed for other platforms such as Blackberry and iOS.