Connecting Food Courts in Mall using Mobile App

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ABSTRACT
This paper represents a system to improve the performance of restaurants at the food courts in mall. The idea represented in the paper focuses on efficient design of system to save customer's time and avoid the situation of long queues and billing hassle. The system explained in this paper uses wireless communication and mobile application technology to enable communication between restaurants and their target customers for order management and billing that will ensure good customer relation management and improve overall performance of restaurants.

Keywords
Wireless Communication, Mobile applications, m-commerce, Shopping cart, Food court management systems, Online payment systems.

1. INTRODUCTION
The system discussed in this paper is for better management of food orders for the food courts at malls. The main focus of the system is to save customers time of ordering and billing. The aim of the idea explained further is to eradicate drawbacks of the current queue system used for food ordering which leads to loss of valuable customer's time. The system functions by using wireless communication system at the mall for connecting restaurant app and the mobile app which will be installed on the customers handheld device like mobile , PDA's [1].

Connecting Food Courts in Mall using Mobile App (CFCMM) which is a mobile application will make it possible for the customers to order food online in particular mall. Furthermore, the list of food item along with the details of price and description can be viewed by the customer. The customer can use the cart option to add items to the cart or remove items from the cart. This will enable the customer to decide which items they want to order and compare menu cards of different food courts. Once the order is placed, the customer will get the acknowledgement and can proceed for the payment after which the user will get the confirmation message from the server [2].

2. EXISTING SYSTEMS
Every shopping mall consists of many food courts ranging from a minimum of five food courts to a maximum of twenty or more food courts. A food court is a place where people can relax and have they meals with their families or friends. The traditional food court order management system uses a self-service scheme, wherein customers need to visit each food court to place their order and must collect their orders on their own. The varieties available in the food courts imposes a huge task of finding a good food counter for the customer to place their order and to be satisfied with the result. Often customers have to visit more than seven to eight food courts until they can make up their minds from exactly which food counter they would like to place their order. This poses as a huge task of searching for a reliable food counter according to the customer's satisfaction. On an average the footfall of about 20,000-25,000 people to the food court on weekdays. The numbers swell-up to 35,000-40,000 people, over the weekends[6] which makes it hard to manage the orders and degrade server performance.

2.1 Traditional System
The traditional food court order management system uses a self-service scheme, wherein customers need to visit each food court to place their order and must collect their orders on their own. The varieties available in the food courts imposes a huge task of finding a good food counter for the customer to place their order and to be satisfied with the result. Often customers have to visit more than seven to eight food courts until they can make up their minds from exactly which food counter they would like to place their order. This poses as a huge task of searching for a reliable food counter according to the customer's satisfaction.

2.2 Electronic token system
Electronic token based system uses a separate hardware device that is given to the customer when the customer arrives at the counter. The customer places the order and takes the hardware device along. Once the order is ready at the restaurant the restaurant system application sends a message to the hardware device which is connected by a wireless communication system to the restaurant application server. As soon as ready order message is sent to the hardware device and the device vibrates which signals the customer that the food is ready to be picked from the food counter thus reduces customers waiting time. The system only saves on the unpredictable waiting time but the billing and ordering functions as seen in the traditional method. The method proposed in this paper can further reduce the time taken for standing in the queue at food court and also for billing

2.3 Tablet device based system
In this system, every table has a tablet which is installed with an application to take orders and make payments. The customer can access the tablet on the table that he/she sits on and places order via an application on the tablet which is connected to restaurant server. The drawback here is that the system is expensive since every table requires a tablet device. Even if single device is used for taking order the problem of long queue is not solved. Tablet device based system will prove inefficient considering the scenario at the food court. Since safety of tablet

device cannot be completely ensured.

3. PROBLEM STATEMENT

Many people visit mall for shopping on weekdays and weekends. It is observed [6] that on an average the footfall of about 20,000-25,000 people to the food court on weekdays. It is seen that lots of people eat at the food courts. Thus a good food court management is necessary. Current system is in efficient in quick orders and delivery. This motivated us to find a system based on smart phone app which makes it smooth to place the order, give feedback and pay bill. Only requirement will be to go and collect food since food court counter will be self-service.

4. WORKING OF CFCMM AT MALL

System architecture of Food Court Order Management System in Malls (CFCMM) is shown in Figure No.1. The system uses a mobile application that shall run on Customers who arrive at the food court in a mall once installed on the mobile phone. The mobile app will connect to food court server for taking order and making payment via mall Wifi system or via internet. Customer places order and Makes payment using mobile app Step 1 and 2. The central database server sends this message of order and payment to the restaurant step 3. Restaurant sends order confirmation message to server and starts preparing the food ordered by the customer step 4. Serversforwards order confirmation message to the customer step 5. Once food is ready the restaurant counter sends message via server to the customer's mobile apps step 6 and 7. Thus Customers gets his order hassle free without having to visit multiple food counters at food court and saves his waiting time in queues to place order and make payment.

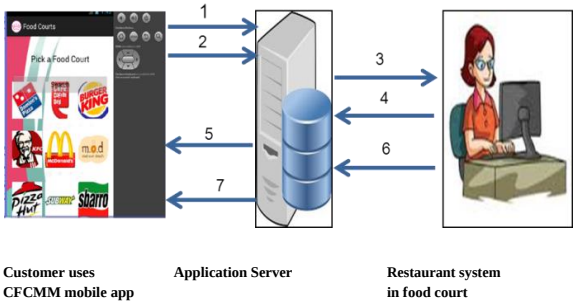

Figure No. 1: Architecture of CFCMM at Mall

Step by step processing of food order using Food Court Order Management System is shown in Figure No. 1 and described below.

1. Initially, the user has to download the application on his/her android phone and install it.

2. Various food courts icon will appear. The user needs to click on one particular icon in order to view the menu.

3. After clicking on the food court icon, the menu page will be displayed. There will be a "ADD" button through which the user can add the items to the cart.

4. The next page will display all the items selected by the customer. This page will also have the option of deleting the selected items.

5. After finalizing the items, the user can proceed for the payment.

6. Payment can be done through credit card, debit card or other payment gateway such as PayTm.

7. The payment details will be sent to the food court after which the food court will confirm the order via a message on mobile application.

8. After the order is ready, a notification will be sent to the user through the app.

9. The user can then collect the food from the respective food counter in the food court.

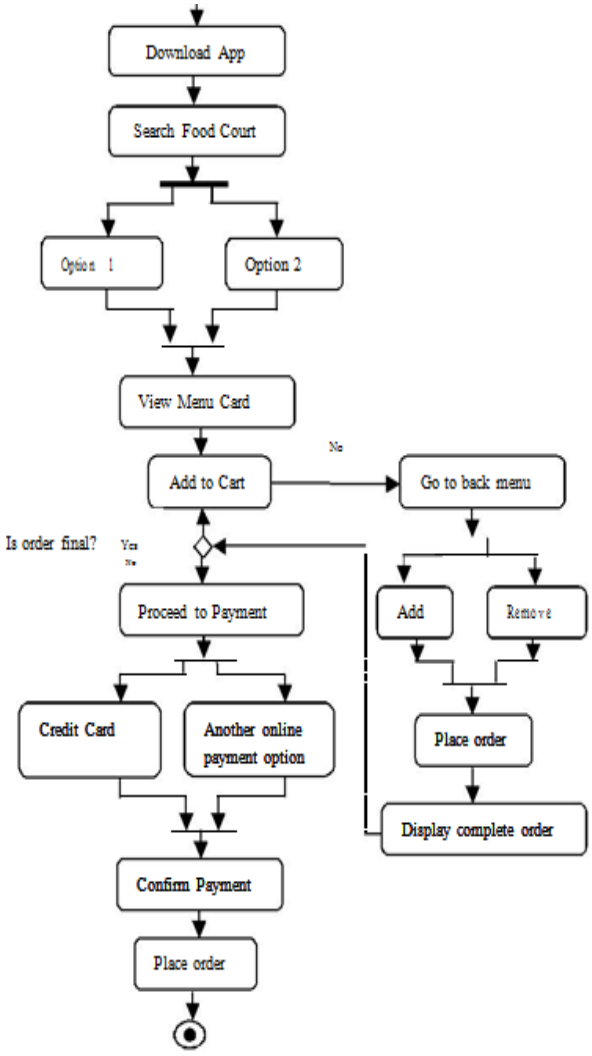

Figure No. 2: Flow ofCFCMM at Mall

5. TECNOLOGIES USED

Android phones can run several applications simultaneously, which obviously makes it easier to multitask and improve the functionality. The android application will help customers to get access to each and every food court available in the mall. Using this application, the customers can browse a variety of menu cards from various food courts and decide on what exactly they wish to order. Also, customers can compare prices of different food items if they are on a budget. This application will also help customers in placing their order online so that they can receive exactly what they want. Customers can make the payments online using a variety of online payments available such as credit cards or Paytm. The customer, after placing their order and making the payment will receive an order conformation on the

application. This application will thus, help customers in saving time and avoiding miscommunication [3] [4] [5].

Android is a software stack for mobile devices that includes an operating system, middleware and various key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. It is a Linux-based operating system for mobile devices such as Smartphone's and tablet computers. It is developed by the Open Handset Alliance led by Google. Android has a large community of developers writing applications ("apps") that extend the functionality of the devices. Developers write primarily in a customized version of Java. Applications can be downloaded from third-party sites or through online stores such as Android Market, the application store run by Google. As of July 2015, there were more than 1.6 million apps available for Android. Recently, in malls, a system is being used wherein the user is provided with a buzzer device. When the customer's order is ready the buzzer will beep and the customer can collect their order from the counter [7] [9][10].

SQLite is a popular choice as embedded database software for local/client storage in application software such as web browsers because it has bindings to many programming languages. SQLite is a software library that implements a self-contained, server less, zero-configuration, transactional SQL database engine. SQLite is not a standalone process like other databases; you can link it statically or dynamically as per requirement with your application [8].

Eclipse is an integrated development environment (IDE) for java and other programming languages. Developed using Java, the eclipse platform can be used to develop rich client applications, integrated development environments and other tools.

6. CONCLUSION

Thus by using wireless communication and mobile application will enable efficient ordering and payment system to reduce queues at food courts in mall. The system discussed in the paper will essence good service and improves overall food court experience of customer makingthe poor order management process simple for the counters at the food court.

Also infrastructure needed is less expensive. Hence it is a viable solution to the queues problem faced at food courts in malls.

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