

A Novel Implementation of Real Time Application Based On E-Menu System – ‘Automated Food Court Management System’

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Abstract—the growth of wireless technology and Mobile devices has made a great impact on our lives. Some efforts have been made to combine and utilize both of these technologies in advancement of hospitality industry. This research work aims to automate the food ordering process in a food-court of a mall and improve the complete dining experience of customers. In this paper we discuss about the design & implementation of automated food ordering system in a mall in which menus of each outlet of a food-court are being digitalized & displayed to customer through an android application.

This system, implements wireless data access to servers. The android application on user’s mobile will have all the menu details. The order details from customer’s mobile are wirelessly updated in central database and subsequently sent to kitchen of respective outlet. The outlet owner can manage the menu modifications easily. The wireless application on mobile devices provide a means of convenience, improving efficiency and accuracy for restaurants by saving time, reducing human errors and real-time customer feedback.

*Keywords:*Food court Automation; Wireless food ordering system; Android Mobile; Android application; Wi-Fi;

I. INTRODUCTION

Nowadays the numbers of malls have increased to a great extent where number of people visit & spend some quality time especially on holidays. At times it becomes very crowded & people have to wait for long time to get their order done at many food outlets. Moreover each customer has to go at each & every outlet, place order, pay & have to wait for the order to get ready & during holidays or peak hour people at times have to wait in long queues to get their order done.

So this current system wastes a lot of time because each time the customer has to go at respective outlets. With the recent development of technologies few techniques has been developed to automate the management of the restaurants but these techniques are very limited in its scope.

The proposed system that is automated food court management system has a very large scope as it has number of features which can replace the traditional systems. It provides us the automation of the food court management which not only helps the customers but also benefits the business.

II. RELATED WORK

A. Existing System

The usual procedure used for food ordering in restaurants is a manual process. It involves the waiters noting down the

menu from customers, transferring the orders to the kitchen, serving the menu, and finally preparing bills. This process even though looks simple, is prone to human errors while note making & delay’s involved. So the customers end-up with an unsatisfactory experience.

So to overcome the limitations in manual system, E-menu system was developed. E-Menu addresses many of the difficulties encountered by both business owners and customers in the dining and entertainment industry & provides an automated food ordering system in a restaurant. It consist of an interactive menu, visualized on a networked LCD screen located on each table or bar,offering customers a full range of ordering and interactive entertainment services[1][2].

In E-menu, customers can quickly and easily: Access high quality images of your menu items; Read detailed descriptions of each item; Place and pay for food and drink orders at their convenience; Enjoy a range of electronic games/entertainment options[1][2].

The existing system consists of limited number of functions & provides user with less options compared to the proposed system. In the existing system i.e. E-menu, the application is limited to single restaurant only with limited number of functionalities.

B. Proposed system

Even though the existing system i.e. E-menu overcomes the shortcomings of manual process, it still has a limited scope when we see about the growth in hospitality & business industries. Nowadays these industries are not only limited to particular high profile restaurants & have been extended to the malls where there has been significant growth in terms of customers visiting it. Each mall has a food court & the proposed system is to automate the complete dining procedure in a food court of a mall from placing an order to making a payment.

To overcome the small scope of the existing system we propose an automated food court management system. In this we add a number of features to the existing E-menu system. It is basically a wireless food ordering system using android devices [3] [4] [5].

It will consist of a handheld device which will be able to communicate wirelessly to output screens in the kitchen of each outlet present in food court and to a central computer used to record/document all orders. The device can be a tablet or mobile phone running with an Android Operating system [3].

The reason for choosing android as a platform for this system is that in recent years, Android devices (tablets and mobile phones) have become extremely popular and

have revolutionized the use of mobile technology in automation of routine task in wireless environment. Android is a Linux based operating system for mobile devices such as smart-phones and tablets. It has number of benefits such as it is, Open Platform/License Free; Robust OS Kernel, Innovative Library Packages; Ease App. Development; Rapid Improvement.

The product is intended to be used by customers in a food court environment. Customers will use this device to perform registration & then to place the order. Apart from placing the orders customers will be notified when the order is ready by using this device only. There will be many in built facilities such as user will be able to get complete information about all the shops in mall, the sales going on & many more.

Orders will be received in the kitchen where the cook will be able to view and arrange the orders. The product will be designed so it can be easily used by an adult. All parts of the system will be easy to learn with a minimal amount of training. The requirements for using the product are basic reading and writing skills.

Every user can register with the system and be a part of the integrated system. Every registered user will have his/her own account wherein he can pool in some money and then use it every other time he wishes to use any of their service and be able to make payments.

To add to all this, the registered customer is entitled to further discounts as a loyalty. The customers will be notified about any offers or sale that is running in the mall. Loyalty programs enhance the binding of a customer with a brand or service, thereby assisting the owner with ideas of improvement and more fertile with revenue earning.

While paying via account, the database stores the guests’ details for enabling the guest with earning points at each time he/she visits the restaurant. You can enable your customers redeem their points with either a discount or offering a food item amounting same number of points. This strategy of building loyalty in more number of guests helps increasing their visits. Also, positive publicity or word of mouth would impress more guests in the database as they pay every time.

Features:-

1) *One Touch Order*

Touch screen ordering, once the order list is finalized, order is sent to billing desk & kitchen unit, thus eliminating any intermediate delay. Just click on the order button and it is done!

2) *Item Modifiers*

Guest can customize their dishes themselves by selecting various options from the modifiers available or by adding custom cooking instructions.

3) *Games & Leisure*

System can include wide range of games and leisure contents like general knowledge, funny photos, astrology, videos, health tips, visual jokes & much more to keep you engaged while you wait for your meal.

4) *Up selling*

While the guests are browsing the food items, the system analyses the patterns & suggest food items as per their

choices. This not only helps them to order quickly, but also helps restaurants to collect additional revenue by pushing up sales.

5) *Feedback*

This option is very valuable for the owner as it allows the guest to give feedback about their experience at the restaurant, feedback about food, services etc. This can be very useful to fine tune the areas where the restaurant is lacking and to promote its strong points [6].

6) *Ad Support*

This system can also allow the restaurant owner a source of additional revenue by displaying audio-video ads to guests while they are browsing. You can also use the same to promote your new variety or your must try dishes.

7) *Wireless Connectivity*

The wireless connectivity enables all the tablets to be connected with Wi-Fi there by giving a hassle free connectivity.

III. ANALYSIS

While performing the analysis the main point is the feasibility of the project. In feasibility we check about the hardware & the software constraints as well as specify who all will be using the application. With the continuous growth in the fields of mobile development & networks this system is completely realistic.

There will be three different users in the system each having a different set of functionalities as we can see from the Use-case diagram drawn for this system.

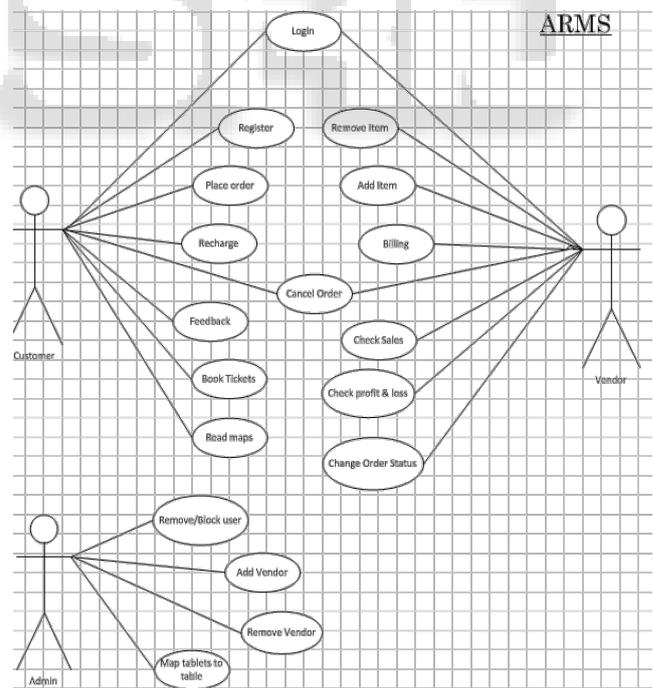


Fig. 1: Use-case diagram

The customer first needs to register itself with the system then he/she can access the application by logging in & performing all the other operations.

The admin is responsible for adding different vendors & mapping the handheld devices to the tables & can also block/remove vendors & customers. Once added the

vendor can login into the system & can perform operations related to inventories & can check its sales & records.

IV. SYSTEM DESIGN

The following section will discuss in detail the approach that will be used to develop this system, the design of the components and the system. The first device to be discussed will be the handheld device and then the central computer will follow.

The handheld device i.e. tablet/mobile phone at each table in food court will be configured with this application’s APK file. Through this application each customer will register, login & perform all the operations. The phone will be capable of two-way communication with a central computer. In addition, the menu will be customizable, and able to be changed wirelessly from the central computer.

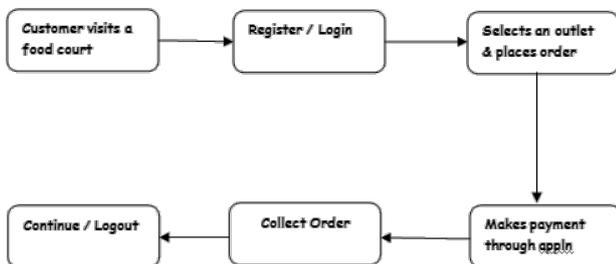
A database will be developed for the central computer that allows it to track all the orders made during a period of time. All devices and software must be easily used.

The following Functional requirements are specified in order to successfully complete the Project.

- 1) Sending a customer’s order to the kitchen
- 2) Receiving notices from the kitchen
- 3) Sending order information to an “accounting database” on the central computer
- 4) Receive menu customizations from the central computer
- 5) Display all menu information defined by software
- 6) Touch screen capabilities

The wireless communication system that we will be using in our application is Wi-Fi. Wi-Fi is a wireless communication method often employed for larger networks. It allows farther ranges and can be more secure than Bluetooth, but it consumes more power and is more difficult to integrate devices.

The following diagram shows us the basic flow of the entire system. When a customer visits a food court he needs to register first using this application which will be installed on the handheld device placed on each table. Registered users directly login & proceed.



Basic Design flow of automated food court management system

Fig. 2: Basic Design flow of automated food court management system

Each user has to deposit some sort of money in their registered account, through this account only their bill will be paid. After this they can browse through the menu of the outlets displayed & select their choice, while confirming

their order they need to pay the bill. The amount is deducted from their account & their order is sent to respective outlet after confirmation.

Users can repeat this procedure for every outlet. In the meanwhile when their order is getting ready they can browse through other facilities available in the application. When the order is about to get ready the customer is notified about the same through the application. After this the customer can collect the order.

V. CONCLUSION

In this paper, we present an automated food court management system which is an extension of E-menu system. This system is convenient, effective and interactive and helps in improving the user experience and also increases the brand value. It will also provide quality of service and customer satisfaction. Overall conclusion is that, this is an innovative way for gaining customer’s attraction and provides a system for managing the food court which facilitates the dining experience to a whole new level.

When talking about the future enhancements, this system can be further extended to inter-connect food courts of multiple malls with same application.

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