Intelligent Restaurant - Menu Ordering System

Ashwini Bankar [1], Sheeja S. Suresh [2]

[1](Vlsi, Ghrietw/ Rtmnu, India)
[2](Vlsi, Ghrietw/ Rtmnu, India)

Abstract: *In most of the restaurant meal ordering is relying on the interaction with waiters to place order into the kitchen. In busy hours of restaurant this coordination is a challenge result in un-satisfaction to the customer. To realize this, Intelligent Restaurant is designed. This Restaurant uses modern innovation such as multi-touch module, RF module, Meal Serving Robot and database to improve quality of services of Restaurant and to enhance customers' dining experience. A meal serving robot is a line following robot which is designed using sensor to track the black line path predetermined for serving. Android Application - PayPal is used for online payment.*
Keywords: *Line following meal-serving robot, Multi-touchable Arduino Mega, RF module, Android App-PayPal, Database.*

I. Introduction

Now a days Digital multi-touch menu cards in restaurant are replacing traditional services where waiters take order from customer according to their menu requirement. In traditional restaurant orders are taken by waiters and they bring the food when it is ready later the customer pay the bill to the waiter or to the accountant at Reception area. This system relies on large numbers of manpower to handle customer reservation, ordering food, placing order on table, reminding orders of customer and billing. Therefore, how to effectively improve the service quality for customers by using advanced technologies has received much attention in recent years. Restaurants only provide passive services where waiter can only deal with customer's order by asking customer's need and transfer order to kitchen and finally cash counter. In a medium to large and busy restaurant this coordination is a challenge and requires an efficient ordering system. Errors in ordering processes lead to incorrect or out of sequence meal preparation or no consumable and results in added cost to the business.

This Project aims to deliver digital meal ordering system wherein order will be placed digitally through touch screen module. This order will be communicated through wireless medium to the database available at cash counter laptop. Orders received from different dining tables will be parked in software at cash counter laptop screen. This similar display will be present in kitchen and according to customer order catering staff will prepare the food. The robot will move around customers for PayPal payment and meal serving.

"Intelligent Restaurant"—it's all about getting all of your different touch-points working together—connected, sharing information, personalizing experiences and speeding processes. I this project Graphical User Interface (GUI) digital touch screen module is used as a food ordering system. Customer can order via this touch screen device placed on each table in the restaurant. Customers view the menu, price and make an order directly using this touch screen system. Then, their orders are sent to the database in cash counter computer and also viewed on the computer screen at the kitchen for food preparation. HTML is used for the designing web pages of restaurant. A line follower robot follows a path that is predetermined in the restaurant and server meal.

II. proposed work

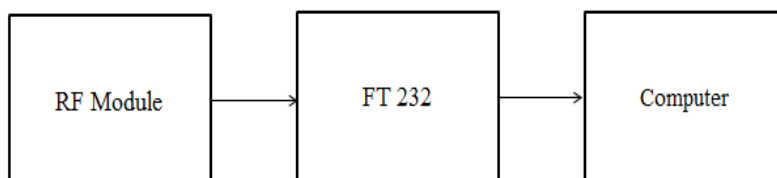### 1.1. Block diagram of proposed work is as follows
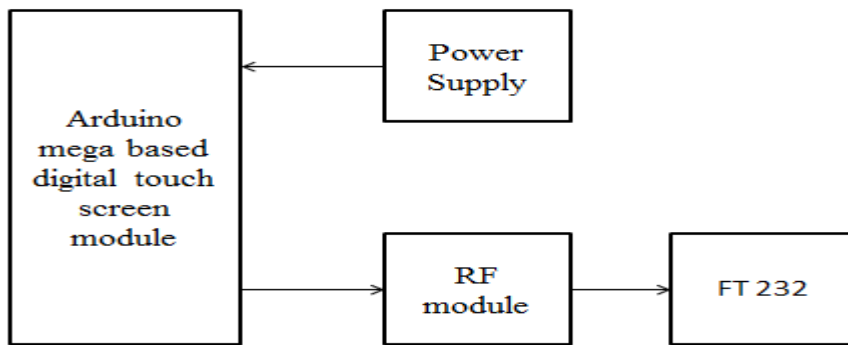

Fig 1. Block Diagram of cash counter and kitchen

Fig 2. Block Diagram of digital touch screen.

In an Intelligent Restaurant system customer will place an order on touching on touch screen module which is placed on every table. First screen of the module is welcome screen. After that menu screen will appear. This page contains information about the menu item and its respective price. For quantity, customers will tap on the '+' or '_' symbol to increase or decrease amount and then place order. Customers will add and remove items and the total cost is calculated in the database. The Restaurant Block diagram is shown in Fig 1. This order is proceed into kitchen and cash counter via RF module. This order will display in cash counter and kitchen for the food preparation.

2.2 I have demonstrated meal service robot i.e. line following. This is a black line follower robot which is designed for food serving to the customer to reduce work load of waiter . It will follow a path that is pre-determined by the Restaurant management.
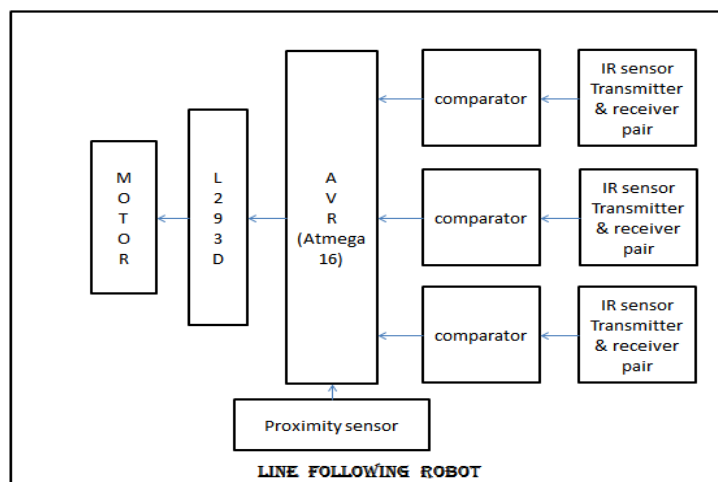

Fig 3: Line following robot

III.   Result

3.1 PAYPAL:
        PayPal is used for online payment which is integrated in android phone
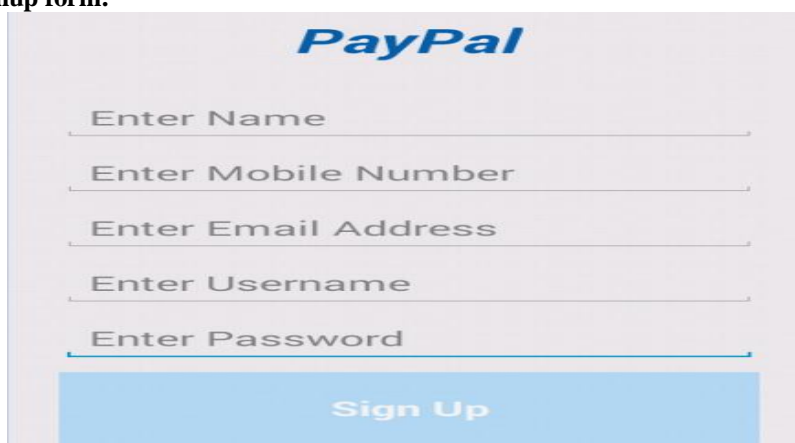
3.1.1 PayPal Signup form:

Fig 4. Front view of PayPal app with Signup form in Android mobile

3.1.2 PayPal Login form:

This login form is required username and password for customer to pay bill.
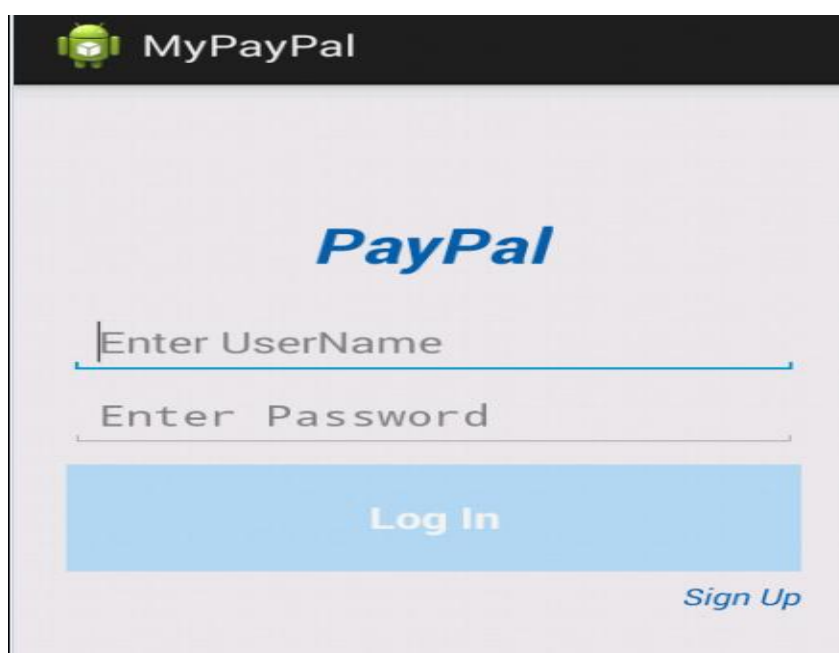

Fig 5. Front view of PayPal app with Login form in Android mobile

3.1.3 PayPal payment form:

Payment form consist of Amount, Card Number, Expired date and cvv code of card and also Mobile Number of Customer.
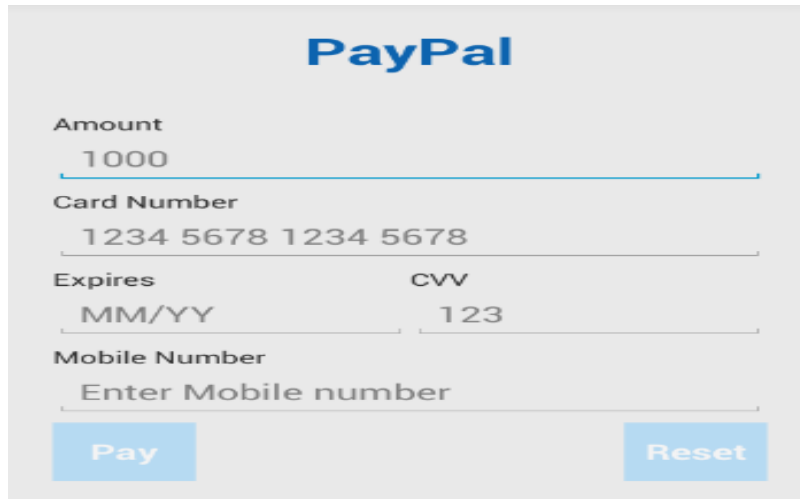
Fig 6. Front view of PayPal app with payment form in Android mobile

3.2 Touch Screen Ordering Module:
3.2 inch TFT LCD Screen Module which is placed on every table for food ordering.

3.2.1 Welcome Screen:

Fig 7. Front view of Digital touch screen (Welcome Screen)

3.2.2 Ordering Screen:

Fig 8. Front view of Digital touch screen (Ordering Screen)

3.3 Web pages of Restaurant
Web pages of Intelligent Restaurant are shown in the fig's below:

3.3.1 Home Page:
It is a main page of restaurant which is visible at cash counter system. This page consists of login form. After login, manager will change content and amount of menu item
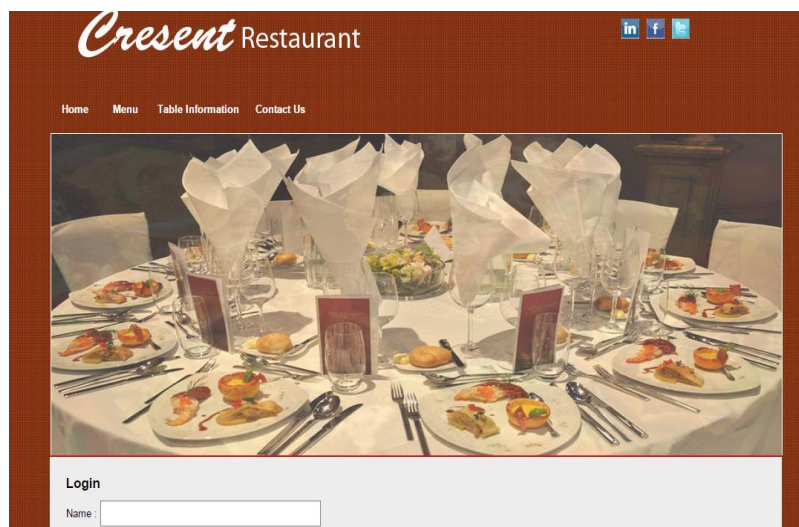

Fig 9. Front view of Home Page of Restaurant at Cash Counter

3.3.2 Menu Page:

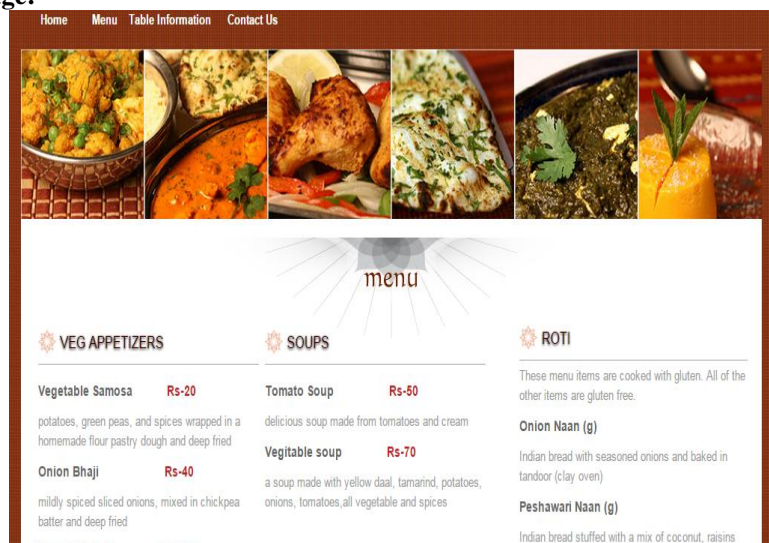Fig 10. Front view of Menu Page of Restaurant at Cash Counter

3.3.3 Database Details:
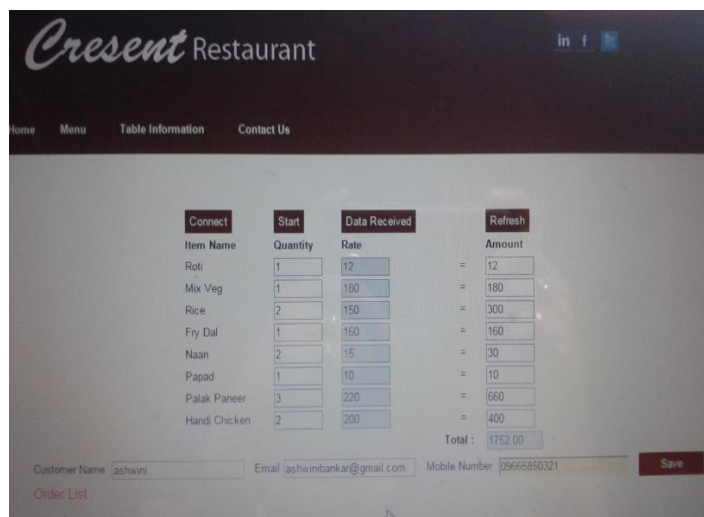Quantity of ordered menu and rate will be displayed in data base.

Fig 11. Front view of Database details at Cash Counter

3.4 Line Following Robot:

Line Following Robot is use as a meal serving Robot which follow a predefine black path to serve food to particular customer.
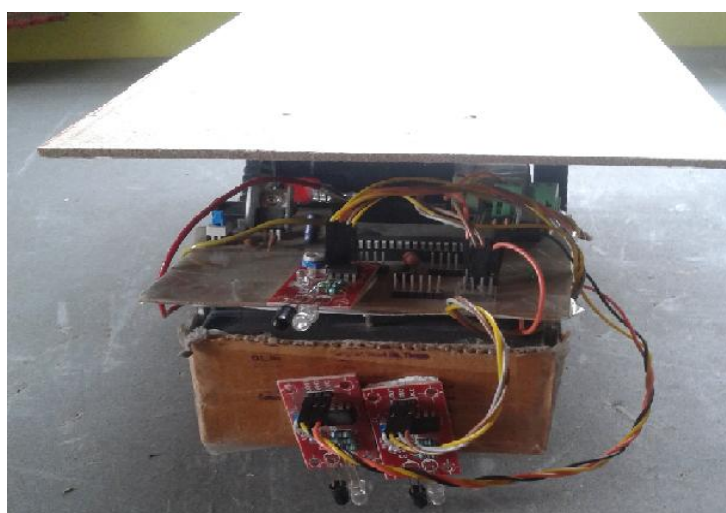

Fig 12. Top view of Line Following Robot for serving Meal

3.5 Analysis Result:

Test Module	Result
Placed order with digital touch screen module	Success
Adding all items to the database.	Success
Calculation of amount of placed order	Success
PayPal online payment	Success
Meal serving by line following Robot	Success

Fig 13. Intelligent Restaurant Analysis Result

IV. Conclusions

This project consist of touch screen module programmed by embedded C, HTML pages for restaurant information, an Android application "PayPal" for online payment and a robot which is line following meal serving bot. This system provide feature to customers to order food touch screen LCD module which is placed in every table, and it is wirelessly connected to the cash counter and the kitchen via RF module. A black line follower robot is used to serve meal to customer which will carry food from kitchen. PayPal is application which is integrated in an android mobile for online payment.

Intelligent restaurant implementation using digital touch screen menu, meal serving robotic technology and PayPal integrated in Android mobile for online payment enhance customer service quality. The system allows customers to order food by touching on the digital module surface which is locally connected to the kitchen and the cashier with RF module. This implementation were developed to enhance quality of services as well as to enhance customers' dining experience. The proposed restaurant intensely enhances the speed and reliability of order fulfillment.

Taking the orders through digital touch screen avoid wastage of paper and also reduces the need of printing hard copy of menu card. A customer going into restaurant does not have to wait for the waiters to take the order. As soon as he occupies a seat, he can order whatever he needs, also the customer has liberty to take its own time to place order.

References

[1]. Juhana Jauhiainen ,Sakari Pieska, , Antti Auno , Markus Liuska , Antti Auno Intelligent Restaurant System Smart- menu CogInfoCom 2013, 4th IEEE Conference on Cognitive Info communications, December , 2013 , Budapest, Hungary

[2]. Ching-Su Chang,Tan-Hsu Tan and Yung-Fu Chen Developing an Intelligent e-Restaurant With a Menu Recommender for Customer-Centric Service vol.42,no-5, IEEE Transactions on systems, man, and cybernetics September 2012.

[3]. SongQingqing and Sun Guiling Design of the Restaurant Self-service Ordering System Based on ZigBee Technology Communications and embedded system lab ,Nankai University Tianjin, China 2010 IEEE.

[4]. Dr. Vinayak Ashok Bharadi, Vivek Ranjan, Nikesh Masiwal, Nikita Verma e-Restaurant: Online Restaurant Management System for Android International Conference & Workshop On Advance Computing 2013.

[5]. A. A. A. Rahman,M. Z. H. Noor, , M. S. A. M. Ali, M. F. Saaid,M. Zolkapli The Development of Self-service Restaurant Ordering System (SROS) Control and System Graduate Research Colloquium (ICSGRC 2012) IEEE 2012 .

[6]. May Hui Tze Yeong,Soon Nyean Cheong, Chun Yee The, Jia Jia Neoh, Wen Jiun Yap Enriching Dining Experience with the Multi-Touchable Entertainment Applications International Conference on Science and Social Research (CSSR 2010), December , 2010, Malaysia.

[7]. KhimLeng Tan, YongChai Tan, KaeVin Goh, BentFei Lew, ZhiChao KhoT ,KienLoong Lee A New Automated Food Delivery System Using Autonomous Track 2010 IEEE Conference on Sustainable Utilization and Development in Engineering and Technology Universiti Tunku Abdul Rahman November 2010, Malaysia.

[8]. Deepak Punetha, Neeraj Kumar, Vartika Mehta Development and Applications of Line Following Robot Based Health Care Management System International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Issue 8,Volume 2, August 2013.