

E-RESTAURANT MANAGEMENT SYSTEM USING ZIGBEE and IoT

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Abstract- In restaurant waiters keep the record of customers' orders and then order goes to kitchen for preparation. Total amount of bill is calculated by cashier. When number of customer increases then workload on waiters increase due to this order misplace can take place. Hence overall service quality may be degrade. Therefore, by using enhance technology we can replace the older way of taking order by pen and paper. Advance technology like touch screen menu display and IoT has been adopted in our system. The tendency of this system is to raise up dining table service. This system has on table touchable menu list and using fingers customer gives order to restaurant server.

Keyword- E-Restaurant, touch screen display, IoT.

I-INTRODUCTION

In 21st century E-restaurant management system is rapidly growing technology. The main aim of our system is to provide speed of operation, large storage capacity, large operating range and less time consuming. In recent days IoT is popular technology which hit the market to exchange the information through internet. In recent days web enable computer system is imply to control traffic flow of order, to create proper billing, reduce waiting time, reduce human mistake. Usually waiters is require to take order, making reservation, to serve meal. After finishing customers has to paid the bill at the counter. In spite of this operation is very easy it increase the workload of waiters which is noticeable which degrade service quality.

Nowadays by using advance technology we can improve service quality. Pertaining to a current time wireless devices such as touch screen menu display has

been taken by choicely to restore old way of taking order using pen and paper. By using computer system multiple tasks can be done more perfectly without invoking any human error. The advancement of graphical-touchable interactive menu allows customer to view order on top of the table, customer place order by using their fingers and order will be transmitted directly to server in real-time

II- LITERATURE REVIEW

The common system have beleaguer with various problems. The most common blooper is waiters making mistake with customer's orders. At times, a waiter can forget to add a precise item, make a changes, or disremember to give the order to kitchen. Customer have to wait for waiter to take their order. They must rely on the waiters to remember their order and specific details. They may also give wrong bill.

Restless and intolerant of delays customer also call frequently to find out the status of their order. Waiters need to frequently check that order is done or is in process. Chef needs to make sure that waiters know that food is ready. In case waiter doesn't know that order is ready this cause the food got cold over time. Busboy always check for table to which need cleaning.

Intelligent restaurant is created to reduce the work load of waiters and to improve the efficiency. This system works on android tablet. The android application access database and download real time menu list. Customer can browse and choice the items and order it.

Waiters came to confirm order and count bill. The order given by customer displayed in the kitchen section. When food item ready it informs to the waiters as well as cashier by mark them as done [1].

Intelligent e-restaurant for customer-centric service provides an online menu ordering and reservation process. This system uses RFID –based membership card, this provides easy identification of customers according to their consumption record. Through PDA waiters take order and though WLAN order is provide to kitchen. According to order chefs prepare menu and waiter convey it to customer. RFID-based PDA is used to diagnose the membership ID to calculate the bill [2].

Self-service ordering information system uses Zigbee based wireless technology. It uses full function device (FFD) and reduced function device (RFD). FFD and RFD communicate with each other [3].

In order to improve quality of service and business of the hospitality industry by consolidate technology. This system fetches all information from a centralized database. The tablet on the customer table contain android application with all restaurant details. Customer tablet, kitchen display and cashier counter connects to each other through wi-fi [4].

III- PROPOSED SYSTEM

Usually waiter is require to take order, making reservation, to record customer order and then transmit to kitchen for preparation. After finishing customers has to paid the bill at the counter. In spite of this operation is very easy it increase the workload of waiters which is noticeable which degrade service quality. Nowadays by using advance technology we can improve service quality.

Table unit:



Fig.1 Table unit

Cooking Section:

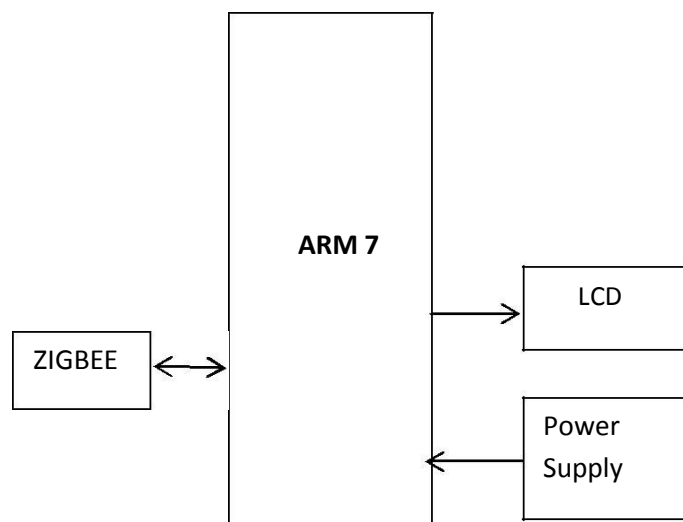


Fig.2 Cooking Section

Reception Section

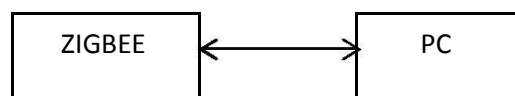


Fig.3 Reception section

Internet of Things:

Internet of things is an rapidly burgeoning topic of conversation. There are many complicity around the IOT but we want to stick to basics. Due to booming environment of internet cost of connecting devices rapidly shrink, technology cost are collapse up to certain level, and smart phone infiltration is sky-rocking. All of these environment provide perfect blizzard for IoT. We can connect no. of devices to internet which includes everything from cell phones, coffee makers, headphones, lamps, wearable devices with an on and off switch to internet. IoT is an gigantic network of connected “things”. For example you are on your way to a meeting, your car could have access to your calendar and already know the best route to take, if the traffic is heavy your car send a text to other party notifying that you will be late.

ARM 7:



Fig.4 ARM 7 LPC 2138

Features:

- Professional EMI/RFI Complaint PCB Layout Design for Noise Reduction
- High Quality Two Layer PTH PCB
- Easy to use DIP Package
- Includes NXP LPC 2138 Microcontroller
- On Board Power LED Indicator
- On Board JTAG Jumper
- On Board 10 MHz Crystal Oscillator
- On Board 32.768 KHz Crystal for RTC
- On Board 3.3V Regulator
- On Board Power Supply de-Coupling Capacitors
- All Port Pins available at Berge Strip
- Header Module can be removed for developing your circuit

Pin diagram of LPC 2138:

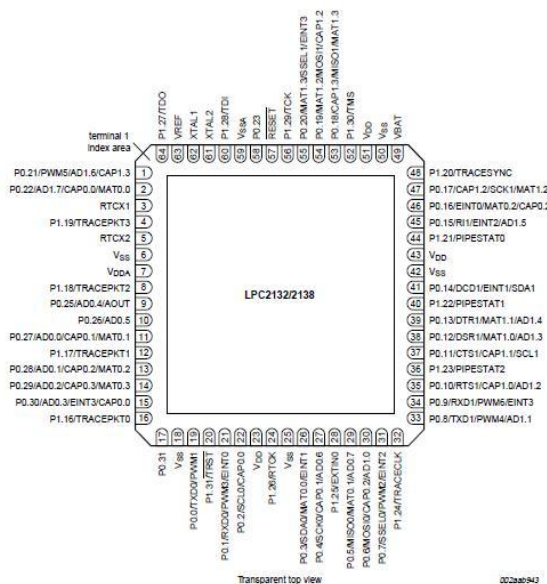


Fig.5 Pin diagram of LPC 2138

Specifications:

- High Performance 32-bit ARM7TDMI-S™ CPU
 - 32 KB Data Memory (SRAM)
 - Two 8-channel 10-bit A/D with conversion times as low as 2.44 us per channel.
 - Single 10-bit D/A converter provide variable analog output.
 - Two 32-bit Timers/External event counters.
- Zigbee:

Zigbee is compatible for long range communication, low power, low cost device. Zigbee device generally used in mesh network. Zigbee network formed an ad-hoc with no centralized control to connect all of the devices.

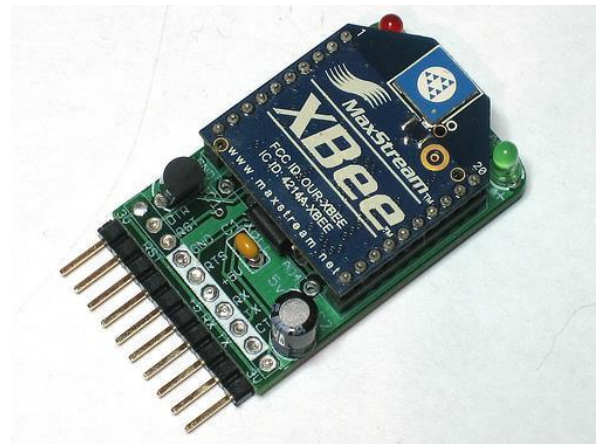


Fig.5 Zigbee Module

Fig.5 shows zigbee module it provides low data rate, long battery life, and secure networking. Zigbee has 250 kbit/s prescribe data rate. Mesh network afford more comprehensive range and high reliability. Zigbee technology is hinge on IEEE 802.15.4 industry standard. Zigbee support up to 3 network topology namely star, mesh and cluster mesh.

Long Range Data Integrity XBee:

- Indoor/Urban: up to 100' (30 m)
- Outdoor line-of-sight: up to 300' (100 m)
- Transmit Power: 1 mW (0 dBm)
- Receiver Sensitivity: -92 dBm

LCD display:

LCD we have used 16x2 LCD which reveal 16 columns and 2 rows. LCD is used to envision the output of the application.

Hardware requires:

- ARM 7
- Zigbee
- LCD display
- Power supply
- PC

Software requires:

- Keil
- Proteus
- Flash magic
- Xampp
- Python 2.7

through COM port. Python gives following output window which shows in fig.7



```
Python 2.7.11 Shell
File Edit Shell Debug Options Window Help
Python 2.7.11 (v2.7.11:6d1b6a68E775, Dec 5 2015, 20:32:19) [MSC v.1500 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: H:\Users\Harish\Desktop\ser.py =====
COM4 is open...
#1
AMUL LASSI-025
25
|
```

Fig.7 Python shell

Fig.7 shows that python shell gives an output window. The ordered item and their cost also displayed.

As shown in above figure “amullassi” item selected by the customer and their price is Rs. 25/- only.

IV- RESULT



Fig.6 menu list

Fig.6 shows sample menu list it includes assorted items like veg, non-veg etc. also items cost also include in addition to that we can put extra effort on quantity, and taste like spicy, medium spicy. After selecting particular item there is a place order button if we press that button then we saw total cost, quantity.

In order to develop android app we use xampp software. Xampp software is used to create database of our system in other word the menu list have been created using PHP. Another software python 2.7 is used to transmit order data



Fig.8 LCD display at kitchen section

Fig.8 shows kitchen section LCD display it helpful to the chef when customer place an order to identify the item. Placed order quantity also plays an important role to chef hence LCD display also shows quantity and selected item. The LCD display is 16x2 character which means it has 16 character and 2 lines. If we increase character and lines then we can show numerous item on LCD.

V-SCOPE

Continuous updates of the food can be given to customer. Wireless touch screen device can be charged by solar. Zigbee pro can be used to increase the range. Developing an artificial intelligence –based e-restaurant system for automatic meal deployment and food material supply demand analysis based on customer expenditure records. A meal ordering system based on mobile communication technology is also underway. Room service on customer in hotels. On table control of appliances like light, fans etc.

VI- CONCLUSION

The e-restaurant management system overcome some of the circumspection confront by the restaurant staff. It provides a legitimate workflow for restaurant staff to manage restaurant operations digitally, from ordering to billing precise. The system could conceivably improve the overall restaurant efficiency, reducing labor cost, providing quality of service and augment customer dining experience

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