

# Special Issue of Second International Conference on Advancements in Research and Development (ICARD 2021)

# Automatic Restaurant Food Ordering Menu Card

M. Kousalya<sup>1</sup>, E. Lakshi<sup>2</sup>, R.K. Mukesh Kanna<sup>3</sup>, G. Pravin<sup>4</sup>, T. Prabhu<sup>5</sup> <sup>1,2,3,4</sup> UG Scholar, Dept. of Electronics and Communication Engineering, SNS College of Technology, Tamil Nadu, India <sup>5</sup>Assistant Professor, Dept. of Electronics and Communication Engineering, SNS College of Technology, Tamil Nadu, India kowsalyamani303@gmail.com<sup>1</sup>

#### Abstract

*In every field of human life, automation has become more important. But there are also many areas where* more common methods are being used. The restaurant ordering system is one such area. The goal of this project is to create a touch-based food ordering methd as well as a secure payment process which can be used to change the conventional ordering process. For general, the food ordering procedure as actually given in the menu card format in restaurant, then the customer will have to choose the food item, so the server would have to come back and take their orders, which is really a long method of processing. The paper recommended a completely integrated ordering system, in which a more user-friendly and touch screen menu card replaces the conventional paper-based menu ordering process. A computer consists of a microcontroller which is connected to the input and output devices. The input device has become a touch - screen module placed on the monitor of the HMI (Human-Machine Interface) that takes feedback from the consumer and input from the microcontroller. The LCD output module in a kitchen and cashier or the manager system that displays the customer order. The RF transceiver module, as well as the cashier/manager system, connects to the table and kitchen system. On the HMI display, the microcontroller displays menu entries as well. At the receiving end, the chosen objects are shown on the LCD, and at the buzzer the latest order will be shown. . Payment can be made with the QR code after completion of your meals from your reserved seat. This technology requires no power from humans and saves time.

#### Keywords: HMI display, RF Transceiver, Buzzer, Microcontroller, QR code

#### 1. Introduction

Now, the IOT network has become trendy in IT sectors. The IOT is basically a new alternative to the environment that can lead to rendering the world interactive. The manual food ordering system is used by many restaurants across the globe every day. This food delivery system uses a pen and paper waiter and handles customer orders. In reality, in order to manage customer requests, order food and put order in the restaurant system, the system depends on the greater number of employees. One form of time-consuming operation is this one. One kind of way process is this one. In

other situations, where there are a lot of customers in a restaurant even at time, it is important to change orders. This creates uncertainty between the customer and the waiter and helps the cashier to manage the entire transaction. More and more organizations are using electronic media and related information sharing Personal Digital Assistant (PDA) due to modern information and communication technology which is basically a new wireless device that replaces traditional working methods for restaurants. There are, however, some limitations of the food ordering PDA system, such as customer planning, staff

operations control and productivity control at peak hours. On the other hand, the type of multitouchable management device has resistive or capacitive touch screen shortcomings, which prove to be expensive. So, we are implementing a new method, i.e., System with Automated Restaurants, to solve those challenges. The goal of this project is to simplify the food ordering method and the payment system for restaurants management and to increase the interaction of customers or restaurant customers. Therefore, we can explore the technologies and usefulness about an interactive restaurant with a touch-screen-based menu ordering process and real-time customer reviews for restaurants and providing customers with payment options. So, it will make the userfriendly. The customer table has all of the menu information in this process. The ordering information from a table is transferred then forwarded to the manager or cash counter and displayed on the LCD display in the kitchen for food preparation. This would reduce the need for the printing of many copies of the menu card. The menu should be quickly updated and handled by the restaurant employees as with the case of written menu cards. The ordering items are often updated in the system and this will also reduce confusion between the customer and the waiter if anything new is served or false orders are eliminated. Our model recommends that we should use a digital menu card instead of conventional menu cards, which would have a range of benefits over the traditional system. It would significantly improve the customer service.

## 2.Literature survey

## 2.1 Restaurant automation system based on iot

Meghana Nandre et al., presented a paper onRestaurant Automation system based on IOT. This paper suggested that the customer take touch-based order using the а resistive touchscreen. Users are now choosing an easy choice for a few days to buy food in restaurants. Since the old method of order taking is difficult in holidays and sometimes human service interruptions. The touch screen allows easy access, and this tool makes the instructions clear. It should be sufficiently transparent to visualize the menu, better response time and stability.[1-4]

# **2.2.** Touchscreen based ordering restaurant device

#### Volume 03 Issue 03S March 2021

Raviprakash Shriwas et al., proposed a paper on Touchscreen Based Ordering Restaurant Device. This paper recommended that the system reduces and enhances Waiter's work load productivity. Contact-based order taking from customers using GLCD (Graphical LCD). The problems of order taking are overcome by Graphical LCD technology. In images or photographs, the food items are shown and the net cost of the food is also seen. For easy understanding of desirable display purposes, it was used mainly to make the order. [5-7]

#### 2.3 Wireless menu implementation using IOT

Annu Lambora et al. published a paper using IOT on Wireless menu implementation. The wireless method of transmitting data using the Wi-Fi module from transmitter to receiver was suggested by this paper. A typical Wi-Fi connects customer orders to both the kitchen monitor and the customer side tablet directly into the kitchen side module. This design configuration increases the restaurant's productivity and saves time and significantly eradicates human errors and facilitates customer feedback by customer owners' recommendations that can improve service quality.[8-10]

## 3. Proposed system

## **Block Diagram- Customer Table Unit**



#### Fig.1. Customer table unit Kitchen Unit and Cash Counter Unit:







## 3.1 Working

The conventional catering system needs a lot of time and is vulnerable to confusion of orders due to errors. The problem with the ordering method for self-service is that self-service restaurants are more popular in metro cities. So, in smaller cities, there are hardly any self-service restaurants open. In order to satisfy the order, these self-service systems require needless delays as well. The problem with the system based on the Zigbee is that it's expensive. Our aim is to develop a costeffective solution that can work in small restaurants that are not ready to spend large amounts of cash on these systems. In order to build a user-friendly ordering environment, the main goal of the proposed solution is to develop and

#### Volume 03 Issue 03S March 2021

implement a fully integrated restaurant menu system. Each table is fitted with an HMI Monitor touch screen. The HMI Display will also act as a menu card that lists all restaurant items as well as the quantity of food. The user can choose the Multilanguage option, enhance the interaction, and guide the customer. Then the order from the touch screen menu list is displayed and put by the customer and the total amount is automatically determined from the contact screen list. The microcontroller PIC16F877A consists of the computer part of the transmitter. The RF transceiver that links the kitchen to the counter of the cashier, as shown in fig 1. The buzzer will signal when we send a new order to the kitchen. The order shown on the LCD along with the number of the client table and the quantity of the food items is taken by the microcontroller just at receiver section, as shown in Fig 2. By checking the QR code and the payment message sent to the cashier's counter or manager, the client pays the bill. This proposal will also alter the way customers order food from the restaurant, then give feedback and reviews to the customer.

## 3.2 Hardware description

#### a) Microcontroller unit

The PIC microcontroller is an aboriginal RISCsupported CMOS (complementary metal oxide semiconductor) microcontroller that uses an isolated bus for instruction and data to allow programme and data memory access at the same time. Low power consumption, resulting in a very small chip size with a small pin count, is the key advantage of CMOS and RISC consolidation. The basic benefit of CMOS is that other production methods have tolerance to noise.

## **Characteristics:**

- RISC CPU High-achievement
- Pace Performing:
- DC- 20 MHz input clock
- DC- 200ns period of instruction
- Modes of overt, implied, and relative addressing
- Reset of Power-on (POR)
- Start-up Timer for the Power-up Timer and Oscillator
- Programmable code-protection for protection
- Power SLEEP mode preservation

Usually, they are low-power devices that run in the voltage range of 2V to 5.5V. They provide 13 interrupt sources, such as external interrupts of pulses and serial interrupts, etc. The flash memory can be rewritten 1000 times easily.



#### Fig.3. PIC 16F877A Microcontroller b) LCD (Liquid Crystal Display)

The HD 44780 is a display device with a liquid crystal dot matrix that can display 16 characters x 2 lines and consists of an LCD screen, an LCD control driver and a driver. This includes the controller, data RAM and ROM of the character generator used to provide the display. Interfacing data is parallel to 8 bits or parallel to 4 bits, and it is possible to transmit or read the data from a microprocessor.



Fig.4. LCD display

#### c) Serial Converter- Serial RS232

Recommended Standard 232 for binary serial communication between devices is а telecommunication standard. The standard was published in 1962 by the radio sector of the EIA for electromechanical devices and modems for wireless data sharing. The normal voltage levels, which prevent noise interruption, have been established and errors in the data exchange have been decreased. EIA defined RS232 as a standard definition "an interface between Data terminal GND DTR equipment and Data communication equipment".



Fig.5. MAX232 pin diagram

#### d) **RF** Transceiver

This RF transceiver has a range of 30 meters with an onboard transceiver antenna built on the Texas Instruments IC Chip (CC2500). This transceiver would be used along with a microcontroller in a typical system. It offers robust packet handling hardware assistance. data buffering. burst transfers, direct channel assessment, link quality indication and radio wake up. It can be found in 2400 ISM SRD band systems at 2483.5mhz. (For example, RKE-two-way Remote Keyless Entry, Wireless Alarm and Protection Systems, AMRautomatic Meter Reading, Consumer Electronics, Industrial Monitoring and Control).



Fig.6. RF Transceiver

#### Specifications

- Long communication distance(About 1000 meters at default setting)Operating frequency range (433.4—473.0MHz)
- Transmit power(max: 20dBm)
- Power supply voltage(DC3.2V ~5.5V)

#### e) HMI Display

## Nextion BASIC NX4024T032 3.2" HMI TFT LCD Touch Display Module



#### Fig.7. HMI display

Nextion is a simplified Human Machine Interface (HMI) solution that provides an interface between a human and a process, machine, program and or system for controlling and simulation. In the area of the Internet of Things (IoT) or consumer electronics, Nextion is primarily used. Generic 3.2

Human Machine Interface TFT Intelligent LCD Touch Display Module Nextion NX4024T032 would be a transparent Human Machine Interface (HMI) system that provides an interface for controlling and simulation between a human and a process, machine, program and or device. In the area of the Internet of Things (IoT) or consumer electronics, Nextion is mostly used. It is the best option to replace the traditional Nixie LCD and LED tube.

## f) Buzzer

A buzzer is used here as an audible warning and is a signalling system, generally electronic, typically used in automobiles, home appliances such as microwave ovens, or game shows. Initially, this device was based on an electromechanical framework similar to an electrical bell without a metal ring (which makes the ringing noise). Now a day, it is more popular to use a ceramic-based piezoelectric sounder that makes a high-pitched tone. In general, this was related to "driver" circuits that altered the pitch of the sound or pulsed the sound on and off.



Fig.8. Buzzer 3.3 Software Description

- A. MP LAB Software
- B. Embedded C
- C. Flash magic

We use MP LAB software to write the program and execute it and also MPLAB provides a PIC app emulator. However, the software emulation of the microcontroller will still suffer from minimal simulation of the device's interaction with its target circuit. The program is written in the embedded "c" language, after completion of executing the program hex file program is dumped into the controller using flash magic.



Fig.9. MP Lab software

## Conclusion

The suggested project for the customer is a very attractive and comfortable one. The bill will be automatically generated in the wireless menu ordering system and customers will pay directly from the reserved seat. From their experience, customers can have input and recommendations and improve daily restaurant service. It's easy to use, user-friendly and simple to use. Today, because of its low cost and ease of use, wireless technology is becoming more and more popular. This device lets people explore the world more easily and comfortably. The menu ordering system for restaurants is a modern and clever solution to menu ordering processes. It removes human labour and therefore makes the bill more reliable for each table. Both customers and restaurant employees will benefit from this method and will totally change the old style of ordering using paper menu cards. As a future scope, it can be implement in Library.In certain libraries, visitors are not permitted to access the library. In this case, if any person wants books, he/she must give the librarian the name of the book. Then the librarian will figure out the books and send them to the customer. In such cases, users of the library can use this project. They can pick the books that they want to order, and they can click the confirm button. The details on the books will be shown on the librarian's screen

#### References

[1].Meghana Nandre., Divya Patil., Kalyani Patil, Suryvashi.J. R (2018). IOT based Restaurant Automation System, International Journal for

Research in Applied Science & Engineering Technology (IJRASET), ISSN 2321-9653.

- [2].Raviprakash shriwas., Nikesh Patel, Asif Bherani., Arti Khajone, Manish Raut (April-2014). Touchscreen based Ordering System for Restaurant. In proceedings of the 2014. International Conference on Communication and signal processing (PP 3-5).
- [3].Annu Lambora, A., & Gupta, K. (2019, February). Implementation of Wireless Menu Using IoT. In 2019 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (COMITCon) (pp. 114-118). IEEE
- [4].Tan, T. H., Chang, C. S., & Chen, Y. F. (2011). Developing an intelligent e-restaurant with a menu recommender for customercentric service. IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews), 42(5), 775-787.
- [5].Mishra, B. K., Choudhary, B. S., &Bakshi, T. (2015, December). Touch based digital ordering system on android using GSM and Bluetooth for restaurants. In 2015 Annual IEEE India Conference (INDICON) (pp. 1-5). IEEE.
- [6].Jakhete, M. D., & Mankar, P. C. (2015). Implementation of Smart Restaurant with emenu Card. International Journal of computer applications, 119(21).
- [7].Bhargave, A., Jadhav, N., Joshi, A., Oke, P., & Lahane, S. R. (2013). Digital ordering Systemfor restaurant using Android. International journal of scientific and research publication.
- [8].KumarG. S., & Amarnath, M. (2015). Touch Screen Based Advanced Menu Ordering System for Restaurants using Raspberry Pi. International Journal of Scientific Engineering and Technology Research, ISSN, 2319-8885.
- [9].Mishra, B. K., Choudhary, B. S., & Bakshi, T. (2015, December). Touch based digital ordering system on android using GSM and Bluetooth for restaurants. In 20 Annual IEEE India Conference (INDICON) (pp. 1-5). IEEE.
- [10].K., Shinde, T., Ingale, D., Solanki, N., & Totare, R. (2015). A Proposed System for Touchpad Based Food Ordering System Using Android Application. International Journal of

Advanced Research in Computer Science & Technology (IJARCST 2015), 3(1).