

# Design of Intelligent Restaurant with a Touch Screen Based Menu Ordering System

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**Abstract:** In today's restaurant Digital multi-touch menu cards and other forms of digital facility are replacing old fashioned services like- waiters can take order from customer and serve them. Intelligent Restaurant system delivering almost infinite flexibility in promoting meal and snack options. Intelligent Restaurant system uses technologies innovatively in a modern restaurant such as multi-touch LCD with Arduino mega, RF module, database & line following Robot to enhance quality of services and to enrich customers' dining experience. A line following robot is designed using sensor operated motors to keep track the line path predetermined for meal serving. PayPal is used for online payment.

**Keywords:** Line following robot, Multi-touchable module, RF module, PayPal, Database

## I. INTRODUCTION

The traditional method commonly used in hotels is to accept customer orders, write them on paper, and then place the order on the kitchen area. A food ordering system is proposed that uses a portable device placed on each table and used for ordering in a restaurant. At this time of pandemic, the human-human interaction is deemed to be unsafe and unhealthy. Similarly, there needs an extra human resource, economic resource and various other resources for the continuation of traditional menu display and ordering system at restaurants and hotels. So, this system tends to change the menu digitalization and ordering system that are exhausting and converts them into something exciting. Something more convenient to digital usage, wireless connections and a screen touch ordering system with a backend at the kitchen that updates. This can be a new practice in scenario of Nepali food chains and restaurants. Basically, the touch screen or display is kept at consumer end for various purposes and sends the data using RF transmitter at the consumer end. At the consumer end. At the receiving end. Arduino Uno is interfaced with RF receiver and other components to process the received data at the kitchen end. A display of data is done at the monitor or similar displaying device. In this way the order is received at the kitchen end which is basically a digital system for replacing traditional menu and order.

## II. LITERATURE SURVEY

Intelligent Restaurant is designed to reduce the work load of waiter and to increase the efficiency. In the paper by Sakari Pieska, Juhana Jauhiainen, Markus Liiska, Antti Auno has proposed that the customer's application works on an Android tablet. This application is connected to the database and download real-time restaurant's menu. The customer can browse the menu and order it. Using the software, customer can call the waiter by pressing a button. The waiter comes to confirm the order and count the bill. This menu can be displayed in the kitchen's display. When this food items are ready then the kitchen staff can mark them as done. And this food items are visible in the cashier and also in waiter application so that they deliver them to customer.

Another paper by Tan-Hsu Tan, Ching-Su Chang, and Yung-Fu Chen has proposed an intelligent e- restaurant for customer-centric service. This system provides an online menu ordering and reservation-making process, and also personal menu recommendation service. With the help of RFID-based membership cards, waiters can immediately identify customers according to their consumption records. The waiter uses a PDA to take orders from the customer and with the use of WLAN order is sent to the kitchen. Then chefs prepare the menu and waiter can deliver it to customer. When the customer has finished the meal, the cashier uses RFID- based PDA to identify the member

Another paper by Sun Guiling, SongQingqing has proposed self-service ordering information system based on ZigBee wireless technology. This system uses FFD (Full Function Device) and RFD (Reduced Function Device). FFD is network coordinator that can communicate with other device; RFD is used in star topology network, which can communicate with the FFD.

### III. PROPOSED WORK

1.1. The generalized block diagram of proposed work is given in fig1.

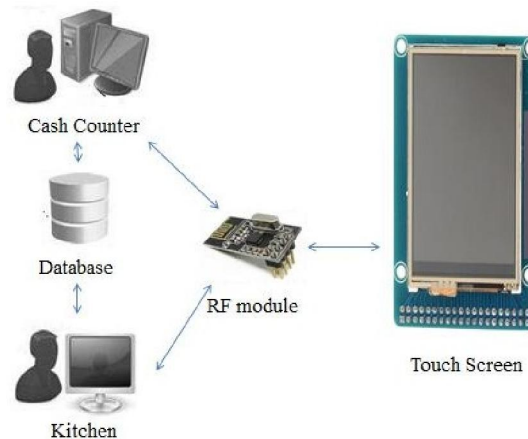


Fig 1: Restaurant functional correlation.

In Intelligent Restaurant system customer place order through touch screen module. On tapping on touchscreen, welcome screen will be appearing. After that menu page will appear. This page contains the information of the menu and price of it. Then, customers tap on the '+' or '-' sign for quantity of menu and then place an order. Customers can add and remove their menu and the total cost is automatically counted. The Restaurant functional correlation as shown in Fig 1. The communication between customers and server is through RF module for a better connection. This order can be viewed by cash counter database and kitchen database for the food preparation.

We have demonstrated service robot i.e. line following robot as part of an intelligent restaurant system. It is a line follower robot that is basically designed to follow a path that is predetermined by the Restaurant management.

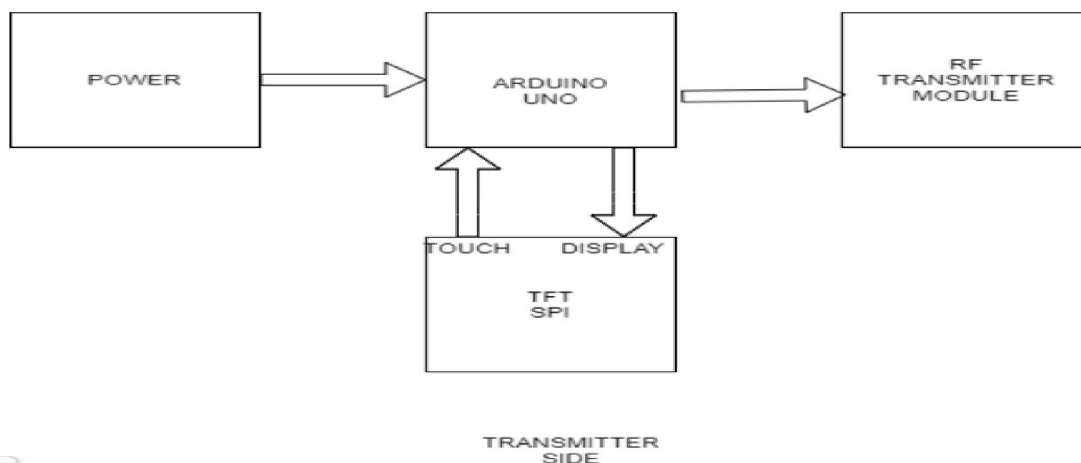
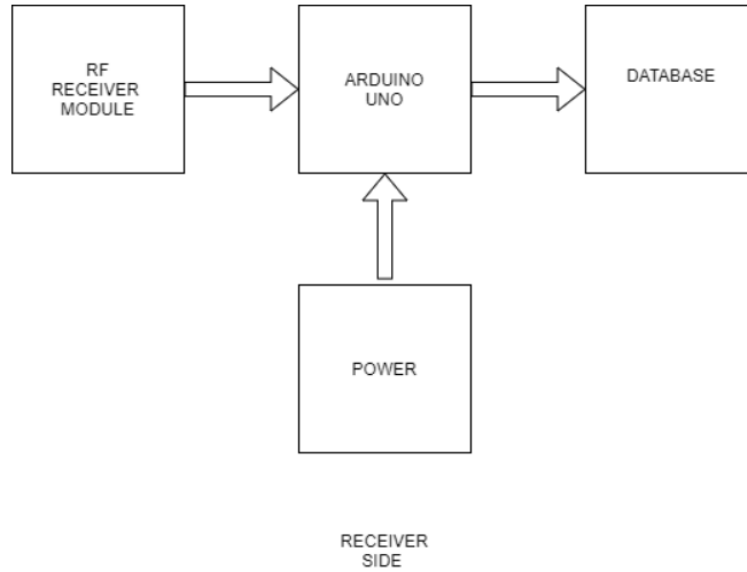
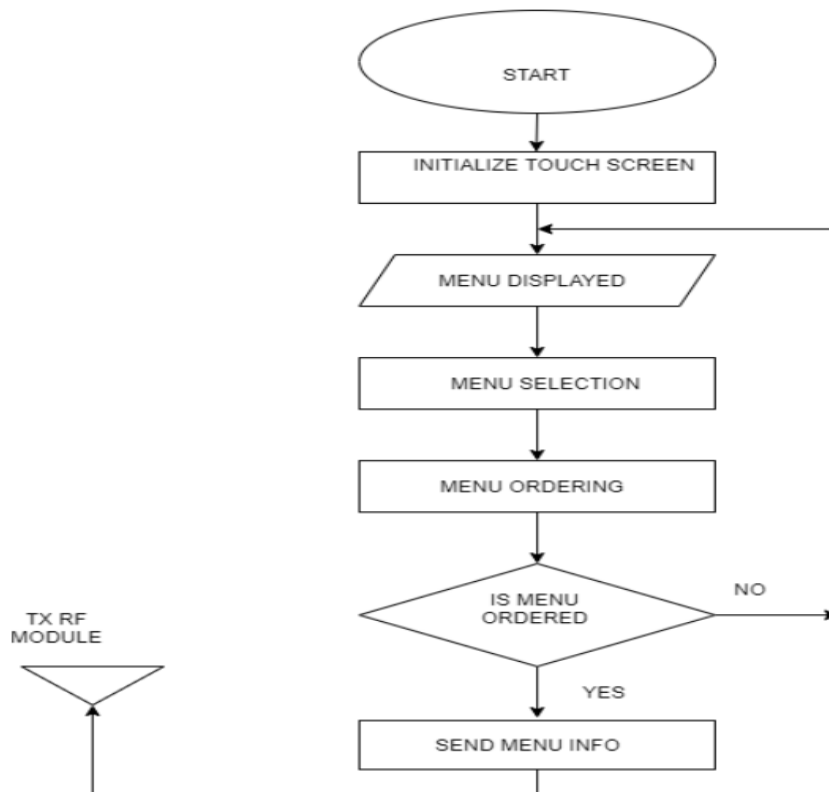


Figure 1: A sample line graph using colors

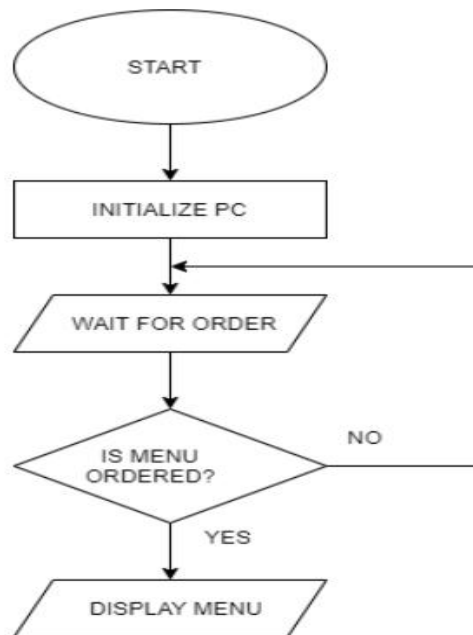


#### IV. SYSTEM FLOWCHART

System flow chart shows the whole work-flow process and shows the sequence of functions that is being done in the system. It also comprises of two sides; receiving and the transmitting part. Here, the flow-chart is used to define and simplify the process that is being implemented in the system.



#### 4.1 Transmitting Side



Flow-chart of receiving part

from the comparator. The outputs of the micro-controller are given to the motor driver IC L293D. A proximity sensor is used to detect an obstacle.

#### 4.2 System Structure

##### Hardware Subsystem

##### Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega1280. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs, a USB connection, a reset button, an ICSP header, a power jack and a 16 MHz crystal oscillator. It contains everything that is needed to support the microcontroller; simply connect it to a computer with the help of USB cable or power it with an AC-to-DC adapter or battery to get started.

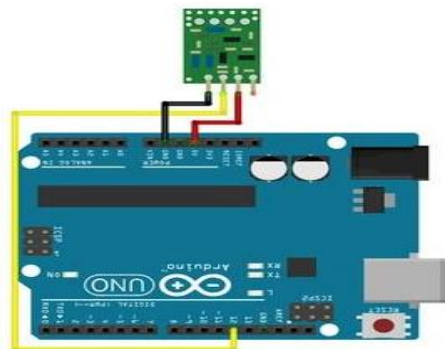


Fig 3. Arduino UNO kit

### LCD -TFT 3.2 inch:



**Fig 4. LCD-TFT3.2inch**

TFT01\_3.2WD is a TFT LCD Screen Module, 40 pins interface, also it include the Touch, SD card and Flash design.

#### Specification:

Screen: 262K Colors

Driver IC: HX8352, replace of ILI9327

High Quality Complete LCD Touch screen Complete Module.

LCD screen + Touch Screen, with LCD amp; Touch Screen Controller.

8051 / AVR / PIC low power controller can also drive this LCD easily.

High portability! Increase development efficiency amp; lower development cost.7

### Arduino TFT Shield (Driver board to drive LCD using Arduino Mega)



**Fig 5. Arduino TFT Shield**

This board has update to Rev2.0 and it is of a white color, it is more stable and the same use it. The TFT01 LCD module work in 3.3V volt and it's not compatible with Arduino MEGA pins, so we make a shield for an Arduino MEGA. Now user can directly plug the TFT01 LCD in the shield and stand on the Arduino MEGA board. The TFT01 MEGA shield V1.0 supports both the 16 bit mode. Because of Arduino Mega board have enough pins for using SD card and Touch function at the same time.

#### Software Subsystem:

##### Hyper Text Markup Language (HTML):

HTML is a standard markup language which is used to create web pages. It is written in form of HTML elements consisting of tags enclosed in angle brackets. For designing Restaurant home page this language is used.

##### Embedded C

Embedded C is a set of language extensions for the C programming language. Because of High level languages i.e. C in the embedded systems, various kinds of support tools like compilers & cross-compilers, ICE, etc. came up and all this facilitated development of embedded systems using C. Embedded c is used to programme Arduino mega.

### PayPal

PayPal is the world's largest online payment network. PayPal is the preferred method of online payment for auction sites such as eBay. PayPal allows guaranteed secure payment over the Internet with your credit card or bank account by taking your information ones and then using this information to make payment to other parties. Following steps a given to use PayPal:

Sign up for an account. Choose from three PayPal account types—Personal, Premier, and Business—and enter an email address, password, and a few more details. Click the Send Money tab enter an amount and recipient's email

### V. CONCLUSION

This project integrated HTML for restaurant menu page designing, embedded C for code of touch screen module, PayPal for online payment and a robot is implemented in intelligent restaurant to fulfill the requirement of customer. This system allows customers to order food by LCD module surface which is programmed by embedded c, which is wirelessly connected to the kitchen and the cash counter via RF module. A line following robot is used to carry meal from kitchen to customer. An android mobile is used in which PayPal is integrated for online payment.

#### 5.1 Advantages

1. Faster service
2. No more waiting to catch the waiter's eye.
3. As customers place their own orders, waiter's staff numbers can be reduced.
4. Create and modify food and drink menus.

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