

# Smart Food Quality Testing and Ordering System Using at Mega328 in Restaurants

D.Priyanka, P.Prathyusha, Ch.Tejeswini, D. Vishal Vardhan, Ch.Rajendra Prasad  
Department of Electronics and Communication Engineering,  
S R Engineering College, Ananthasagar, Hasanparthy (M),  
Warangal Urban, Telangana506371, India  
doddipriyanka996@gmail.com, rajendra\_prasad\_ch@srecwarangal.ac.in

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## Abstract:

In restaurant customers and waiters face problems in giving and taking orders. People don't know the quality of food whether it is fresh or not and wasting their time, waiting for the bill. To address these problems we proposed a "smart food quality testing and ordering system".The system designed using AT Mega328, Passive infrared (PIR) sensor, MQ3 sensor, Liquid Crystal Display(LCD), Bluetooth HC-05 and keypad. The PIR sensor gives customer availability at a particular table.The MQ3 sensor detects food quality. The customer order the required items by the keypad. The LCDdisplaysthe available items and cost of items. The Bluetooth HC-05 module will send messages or information about the ordered items to the chef.

*Keywords* —MQ3 sensor, keypad, LCD, AT Mega328, PIR sensor, Bluetooth HC-05.

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## I. INTRODUCTION

The aim is to develop a Smart food quality testing and ordering system using Arduinouno in restaurants to provide smart ordering and quality food to the customers which helps to save healthy and time. The main goal of this paper is to draw in customers and also adds to the efficiency of maintaining the restaurant's ordering and billing sections. We propose a replacement way of how

people acquire information. Our research is to explore new ways of technology to remain informed.

The main objective is to apply a system for improvement of health and time via multiple sensors. Food hygiene and smart ordering. The quality of the food needs to be monitored and it must be prevented from rotting and decaying by the atmosphere factors like temperature, humidity, and

dark. Therefore it is useful to deploy quality monitoring devices at food stores. These quality monitoring devices keep a watch on the environmental factor that causes or pace up decay of the food. There is a smart ordering system that saves customers time and healthy. The customer order the required items by the keypad and the order items and bill will be displayed on the LCD. The ordered items message or information will send to the chef with the help of a blue tooth and after order delivered then there is a food quality detector to test the food quality.

The Arduino Uno can be programmed to analyze some signals from sensors PIR and MQ3. The passive infrared sensor which measures infrared light emitting from the object. It is used to detect whether a human has moved in or out of the sensor range. MQ3 sensor detects the quality of food. It detects the gases and ethanol content based on these factors we can detect the quality of food. LCD is used to display the items and bills. Bluetooth HC-05 will send messages or information about the ordered items to the chef.

## **II. LITERATURE REVIEW**

The existing method and one of the oldest ways in restaurants is the manual method of checking the parameters. In [1] authors proposed an application for the food ordering system in restaurants by employing the client/server approach. This system can reduce the waiting time spent by customers at the restaurants. A faster ordering system for the restaurants is presented in [2]. This system is designed using the Peripheral Interface Controller (PIC) and Bluetooth technology. By implementing this system [3], for autonomous mobile robots developed a control system used in Hotel management. The two basic motion algorithms focused are the GOTO algorithm and the FOLLOW algorithm.

The system proposed in paper [4] was a basic dynamic database utility system, which fetches all information from a centralized database. The tablet contains the android application with all the restaurant and menu details at the customer table. In [5] employed a combination of Bluetooth technology along with the android phone. An android application was designed which contains food item details in the restaurant. The data input source was a tablet and the output source was PC. The research paper [6] introduced the Smart Ordering System, which was also a fast way to order food at a restaurant. The order made by inserting the code on the keypad menu. These codes came along with the menu. The signal would be delivered to the order by the Zigbee technology and it might automatically be displayed on the screen within the kitchen.

A smart ordering system is implemented in [7], by employing PIC microcontroller, Wireless transceiver, and keypad. Food pre-order system using a web-based application [8], in which customers can be able to create the order before they approach the restaurant. Customers using smartphones. When the customer approaches the restaurant, the saved order can be confirmed by touching the smartphone. The list of selected pre-order items shall be shown on the kitchen screen, and when confirmed, the order slip shall be printed for further order processing. The solution provides an easy and convenient way to select a pre-order transaction from customers.

In [9] Cloud computing is defined as storing the data in the cloud and running the applications which are connected with it. Everything is hosted in the cloud, which is connected to many computers and servers through the internet. In [10] traffic light system (TLS) employed for emergency vehicles. This system effectively employs the audio

Frequency (RF) technology and Arduino UNO to clear the flow of traffic for an emergency vehicle to reach the destination on time. In [11] authors presented a home monitoring system by using the ESP32 module. It helps the user to monitor various conditions in the home-like room temperature, gas leakage, water levels in the tank and person detection and control various appliances such as light, fan, motor, gas knob and make a decision based on the feedback of sensors remotely.

Based on the all literature reviewed, every project is implementing the smart restaurant system but our project has a smart ordering system along with testing the quality of the food. The table has a smart menu that gives the details about the items and it displays the ordered items on the LCD. After ordering the items information or message send to the chef with the help of Bluetooth. After ordering the items their system to detects the quality of food.

### III. PROPOSED SYSTEM

The figure 1 shows the architecture of the smart food ordering system with quality checking. If a

customer comes to the restaurants and they will go to tables and their PIR sensor detects the person's infrared radiation and suddenly the supply will on and the LCD will show some welcome message on the LCD. There will be a keypad to order the food items. The food items which were ordered the person will be displayed on the LCD system. After ordering the food items the message will send to the chef with the help of Bluetooth connection with the system. The order will be fast no need for wasting time in the restaurants. The food items will be delivered soon and after the food deliver there testing quality of the food by using mq3 sensor it will show the quality of the food if the food bad we can return it and if it good means we can eat the food and eating of the food it will display the bill of the food items. By using this system we can save our time and healthy. It's a simple model of operation for the customers. The complete operation of proposed system is represented in flowchart as shown in figure 2. After giving the hardware and software connections as mentioned above, the method of implementation is that this paper is discussed below:

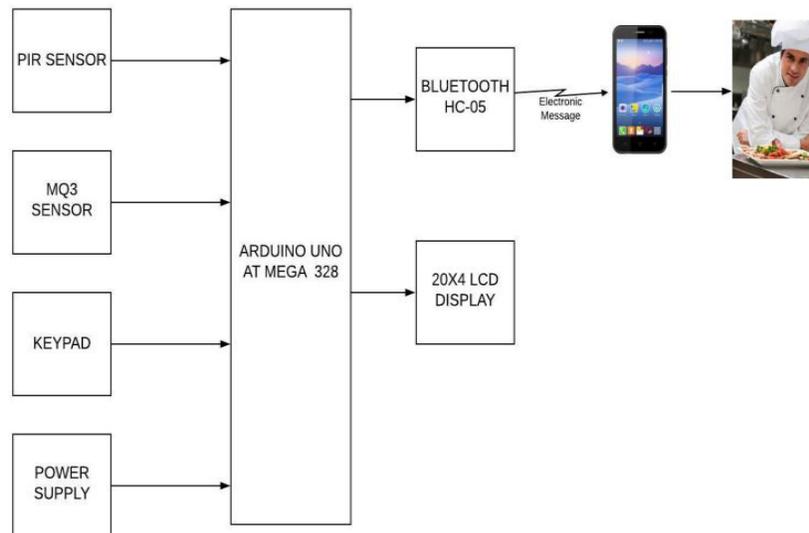


Fig. 1 The Architecture of smart ordering system with quality checking

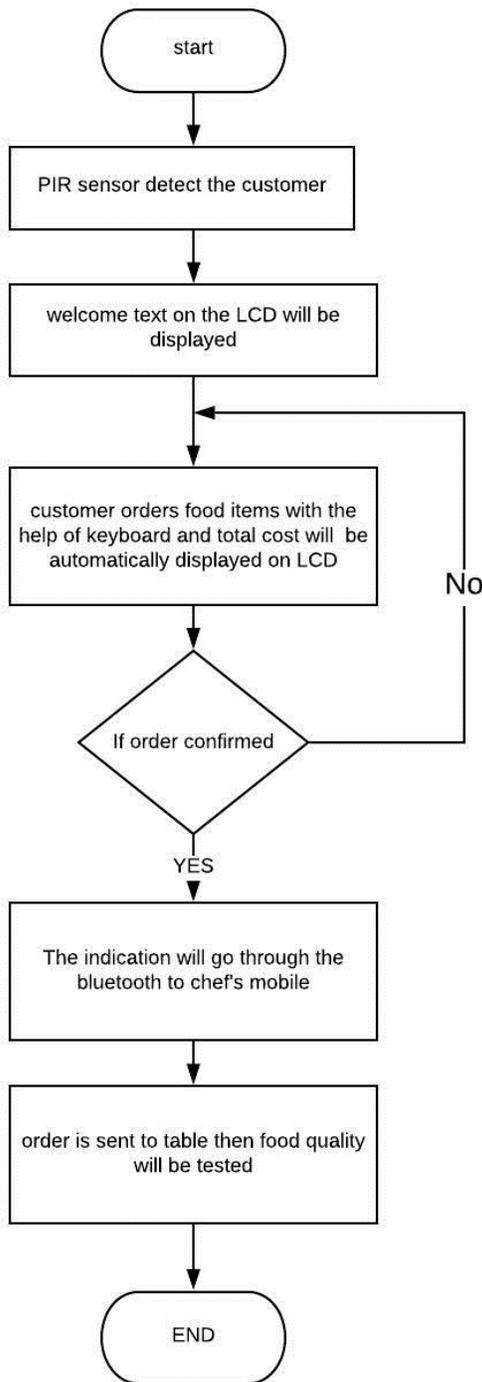


Fig. 2 System Process Flow diagram

**Step 1.** After constructing the block diagram in the software and giving the hardware connections, click run simulation.

**Step 2.** The functional process of this project has 5 main conditions. Firstly PIR detects the customer’s radiation.

**Step 3.** Then the LCD will on then the menu will be displayed on the LCD.

**Step 4.** There is a keypad to order the food items.

**Step 5.** By using keypad we can order the food items that food items were displayed on the LCD and also they will be Bluetooth connection with the help of these the ordered items information or message will be sent to the chef.

**Step 6.** After serving the food there is a food quality testing detector to detect the food whether the food is good or bad quality.

### V. RESULTS AND DISCUSSION

In Fig.3 we can see that the product of food quality testing and ordering system. As we recognize that in large eating places waiter will take a lengthy time to comes near customers and the order will be served late and also billing will be late which affects wastage of valuable time for customers.

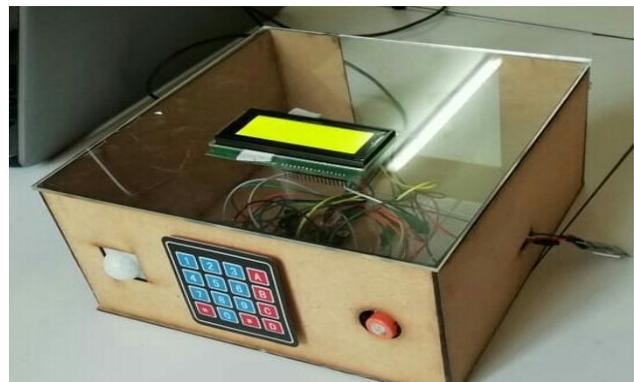


Fig. 3 Complete food ordering and quality checking system

**Step 1.** Fig.4 shows that when customer enters the restaurant and sit in a table then PIR sensor will detects the person and it displays the welcome message on the LCD.



Fig. 4 Welcome message for the customers



Fig.7 Selection panel for items

**Step 2.** In Fig 5 the system is asking to select your items.



Fig. 5 Select items display message

**Step 3.** In Fig 6 the menu will be displayed in the LCD that you can select your item.



Fig. 6 Display of food items

**Step 4.** In Fig 7 the customer has to order by pressing key through corresponding item.

**Step 5.** In Fig 8 it displays the cost and it asks for the number of plates. Then the user has to select how many plates they want.



Fig. 8 Cost/item display

**Step 6.** In Fig 9 if the user enters a higher requirement then the ordered item list is sent to the chef by using bluetooth.



Fig. 9 Message received at the chef

**Step 7.**In Fig 10 after serving the food the MQ3 will detects the food quality.If the food is good then it displays food quality is good. If the food is spoiled then it displays food is not good.



Fig.10 Food quality checking display

## VI. CONCLUSIONS

By replacing the traditional paper menu slowly over the keypad menu for the restaurant, this system is going to be enhanced in revenues. This system attracts customers and adds the efficiency of maintaining the restaurant's ordering and billing sections. By implementing smart food quality testing and ordering system using Arduino Uno in restaurants the customer can save there time and they can eat safely and hygiene food.

## ACKNOWLEDGMENT

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