

# **Design & Implementation of Smart Restaurant Menu Ordering & Delivery System Using Line Following Robot**

Shital Barsu Parate

Dept. of Electronics and Telecommunication (ECE),  
Tulsiramji Gaikwad Patil College of Engineering and Technology, Nagpur, India

---

**Abstract** - The significant issue looked in eateries and inns is the nature of administration given by them particularly requesting of food. Generally, it used to consume most of the time for food ordering as waiter used to note down orders, then place it in kitchen and when the food was ready the waiter used to bring the food. It additionally elaborate conventional pen and paper strategy and the cycle was tedious. It additionally elaborate a ton of wastage of paper. Thus, we have planned the smart restaurant in which the orders will be set paperless utilizing Arduino UNO, TFT touch display associated with the kitchen chef expert straightforwardly utilizing RF Transmitter. This act as the transmitting section. At the Receiver side, the order placed is seen on LCD screen and buzzer is placed for the alert with the assistance of RF Receiver and I2C Module affirmed the submitting of request to kitchen. Thus, the specialists focus only on the billing and other work process and offered better quality types of service. We figured out that this technique is helpful in numerous ways like-It saved the wastage of paper as well as decreased the burden on the waiters and laborers to incredible extent. Using time effectively was additionally done as an ever increasing number of clients could be taken care of by taking their orders and offer them quality assurance and service. This arrangement is very down to earth on premise such that this framework can be carried out for little new startups hotel, restaurants, and cafés. It even takes out the mistakes happened because of customary strategies and furthermore includes steady upgradation and upliftment of the framework helps in better client end administrations.

**Keywords** - Waiter Robot, restaurant automation, Line following, Menu bar.

---

Date of Submission: 04-05-2022

Date of acceptance: 18-05-2022

---

## **I. INTRODUCTION**

Dinning is enjoyed by everyone whenever we go on vacations, holidaying and other activities. We always appreciate the quality of service provided by restaurants if they serve as per our needs and this all depend on the dining and the quality of service provided by them to the customers. But sometimes there is a delay in this service and the customers get irritated. It is not totally fault of either the hotel-staff due to work load of taking continuous orders and customers are also in a jiffy to move ahead in their routine work. So, remedy to this issue is that we have designed a smart restaurant menu rdering system which is direct connection between customer and the hotel chef and the order will be placed directly to kitchen. So, basically our system is divided into two parts i.e. first one is the Transmitter Section and Second one is the Receiver section. In Transmitter section we have used Arduino UNO, TFT display and transmitter which will transmit the data given by the customers which includes the food items ordered and in the kitchen the chef will receive the order. Hence, food will be prepared quickly without wastage of time. The second point of focus is that it is environment friendly. To tell in short, in earlier times the waiter used to note down the order on paper and then place the order. After that the paper would be discarded. So, we know that lacks of people visit the hotels every day. So, there was a huge wastage of paper. But our system overcame that issue by directly placing the orders to the kitchen. Hence, the hotel staff can be engaged in other work like delivery of the food, billing and remote location services. Hence, it increases the efficiency of providing quality services to the customers. Another issue was the hand-writing of the waiters, sometimes undecipherable to chef. But in our system due to usage of TFT LCD display there is standard fontwidth size and bright cool color which will be eye stress reliever. Earlier there were various systems of smart restaurant which included using of Zig-bee technology, virtual hotel concept. But all this required highly skilled labors, source of income and setup. So, our Arduino set-up is user friendly as it is easily configurable and even average learned person can operate it. The second interesting fact is that the system is pocket friendly as it is onetime investment.

## II. LITERATURE SURVEY

[1] Serving automation New Generation Electronic Waiter: In today's contemporary world the utilization of automation is quickly increasing. Robots square measure capable of doing work a lot of effectively and with efficiency than humans. One such example are often SERVING automation. There square measure multiple researches done on serving automation. The paper shows the operating of Serving automation which can take order further as serve the food to the client. The implementation is finished with on the market resources to cut back the value of project. [2] sensible Floor Cleaning Robot: With the advancement of technology, everybody needs their tasks to be drained a best attainable approach. The paper concentrates in planning of a wise Floor cleansing automation. The automation will add each manual Associate in Nursing autonomous modes as well as programing for specific time and bag-less dirt instrumentation [3] Waiter Robot—answer to edifice Automation: the most plan of this paper is to style a automation or an agent which will do the task a Waiter. the issues concerning redoubled waiting time are often handled with the assistance of this “Waiter Robots”. The wanted order is forwarded to the room. [4] welfare work Robots publically and personal Environments: analysis on service robots majorly in hospital industries has been redoubled these days thanks to this covid-19 pandemic. attainable solutions square measure to be self-addressed to beat the issues faced by the health care professionals within the treatment of their patients while not being infected themselves in treating the patients.

## III. METHODOLOGY

The proposed system contains both hardware and software tools as components. Here the Arduino UNO is used to establish the connection with the software and hardware components. It also contains IR sensor module and RF module which is used to display the selected menu on LCD display with the table number. So that the robot will exactly know to reach the respective table which is requesting for the service.

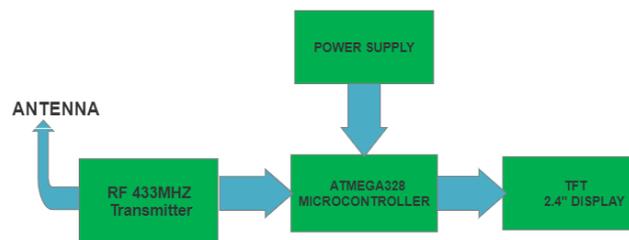


FIG:- BLOCK DIAGRAM OF TRANSMITTER

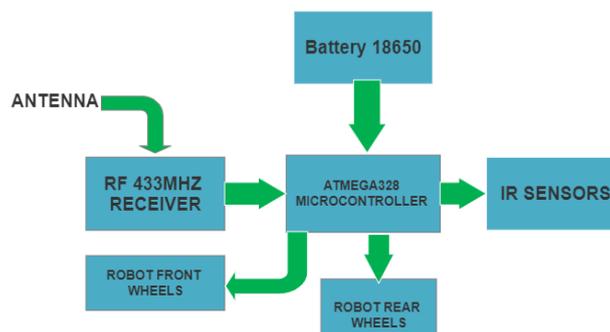


FIG:- BLOCK DIAGRAM OF RECEIVERS

Fig. 1 Connection of Device

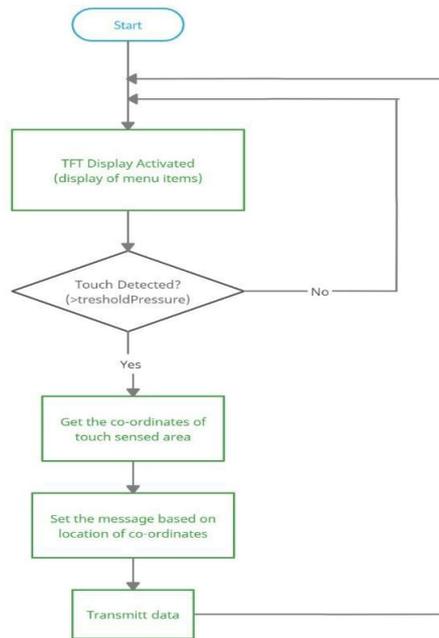


Fig. 2 Flow chart of working of the transmitter section

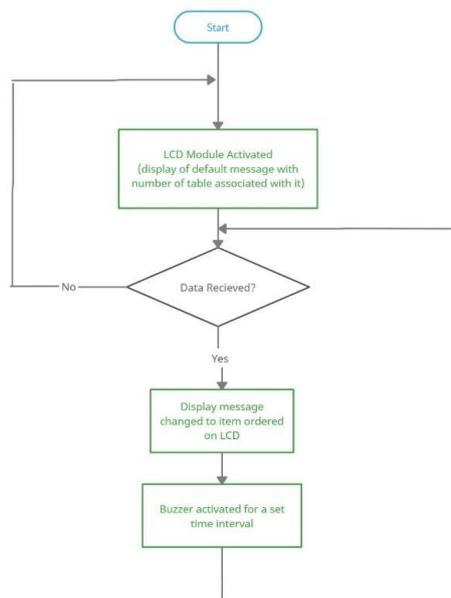


Fig. 3 Flow chart of working of the receiver section

#### IV. RESULTS ANDDISCUSSION

The system uses RPA, may be a method that's used instinctively perform sure tasks or operation. usually all of those actions turn up in avirtual reality and not on screen. So, so as to request the Servexa automation the client ought to press a button gift on every table that makes the task of requesting the automation easier. every button on the table includes of 3v of power output and thus the number of energy consumed is incredibly less. As presently because the button is ironed the automation moves towards the table. Whenever the automation encounters Associate in Nursing obstacle in its path, the IR detector gift on the automation can sight the obstacle by observant the amendment in output of detector it sends a proof to the buzzer and therefore the beep indicates the presence of obstacles within the path. The customer's order via data input device that's placed on the automation. Customers read the menu, worth and build order directly victimisation this method. Then the order are showed on the OLED display even that's gift on the automation. Autarchic(autonomous) serving automation collects the order furthermore serves the food to the various tables assigned.

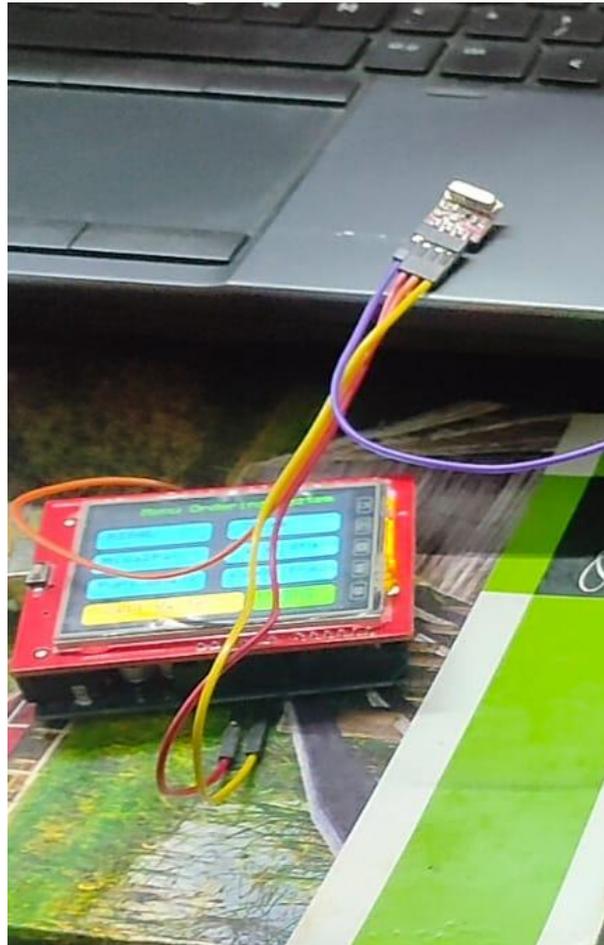


Fig. 4 RF 433MHz transmitter

The defined system was initially implemented on a smaller scale where a small robot was made and it was made to travel through different orientations of the restaurant and thus, improve the reliability of the traversal. The communication part of the system was also taken care of using IR sensor. The implemented prototype of the system was tested for various constraints and loopholes but the result was quite satisfying. The robot is tested with five sample tables, and the accuracy is around 95%. The tray placing mechanism also gave astonishing results.

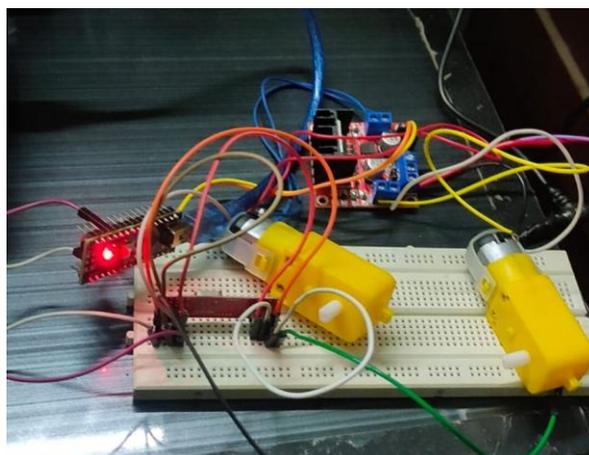


Fig. 5 Arduino UNO with RF 433MHz receiver

## V. CONCLUSION

This project helps in reducing the shortage of human resources to serve in restaurants. The automation is price effective once we have a tendency to designed later simply maintenance is needed. within the future work the innovation of the hardware and software package elements are going to be done. This model is utilized in the hospital to serve a food and medicines for the patients, and within the flat or in some gated communities to deliver a food or food things. To be a lot of clear and precise the current project isn't for a particular use rather it's multiple uses also. So,with the assistance of RPA it's straightforward to attain time potency, price reduction, potency in work and additionally it addresses the necessity of man power.

## REFERENCES

- [1]. Neeti Malik, Neetu Rani, Alpana, Singh Pratibha, Srishti Pragma Serving Robot “New Generation Electronic Waiter” International Journal for innovative Research in Science and Technology Volume 2 Issue 11 ISSN:2349-6010
- [2]. Uman Khalid, Muhammad Faizan Baloch, Haseeb Haider, Muhammad Usman Sardar, Muhammad Faisal Khan, Abdul Basit Zia and Tahseen Amin Khan Qasuria “Smart Floor Cleaning Robot” 2015
- [3]. akari Pieska , Mika Luimulai, Juhana Jauhiainen , and Van Spiz Centria Research and Development “Social Service Robots Publicly and Private Environments”
- [4]. Sun Guiling, Song Qingming “Design of the Restaurant Self-Service Ordering System Supportes ZigBee Technology” Communications and embedded system lab College of data Technology and Science, Nankai University Tianjin, China.
- [5]. Yamin Nyein, Than Htike Aung, ” Implementation of Menu Ordering System Using Zigbee Technology” for
- [6]. “International journal of Science, Engineering and Technology Research (IJSETR)” Volume 8, Issue 6, June 2019, ISSN: 2278-7798.
- [7]. Bhaskar Kumar Mishra, Bhawani Singh Choudhary and Tanmay Bakshi from “VIT University Chennai, Tamil Nadu, India” for topic “Touch Based Digital Ordering System on Android using GSM and Bluetooth for Restaurants” in IEEE INDIC N 2015 1570178803.
- [8]. Kuan-Yu Lina , Chih-Hun Chen a , Zhe-Ming Zhang b , Sheng-Chuan Ou a on “NFC-based mobile application design restaurant ordering system APP” in “Proceedings of IEEE International Conference on Applied System Innovation 2018 IEEE ICASI 2018-Meen, Prior & Lam(Eds)”.
- [9]. Takuma Fujita, Hideki Shimada, and Kenya Sato on “Self-ordering System of Restaurants for Considering Allergy Information” in “IEEE Consumer Communications and Networking Conference (CCNC 14): Consumer eHealth Platforms Services and Applications –CeHPSA”
- [10]. Noor Azah Samsudin, Shamsul Kamal Ahmad Khalid, Mohd Fikry Akmal Mohd Kohar, Zulkifli Senin, Mohd Nor Ikhlas an on “A customizable wireless food ordering system with Realtime customer feedback “ in “2017 IEEE Symposium on Wireless Technology and Applications (ISWTA), September 25-28, 2017, Langkawi, Malaysia”.
- [11]. Annu Lambora, Kunal Gupta on “Implementation of Wireless Menu Using IoT “ in “2019 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (Com-IT-Con), India, 14th -16th Feb”.
- [12]. N. Fathima, A. Ahammed, R. Banu, B.D. Parameshachari, and N.M.Naik, N.M., “Optimized neighbor discovery in Internet of Things (IoT),” In Proc. of International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICECCOT).