Automated Restaurant System Using IoT

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Abstract **- Now a day's people are preferring everything advance and technology based which can make their work easier and faster. In the same path we are introducing the concept of automated restaurant which will be based upon the technology like IOT, robotics, automatic gate opening using sensors and QR code-based menu ordering system. This project is built to give sense of automation in restaurant sector. This will totally be the touch-free and hassle-free experience, thus helps in maintaining social distancing and hygiene during this pandemic situation.**

Index Terms **- Automated restaurant, Food ordering, Line follower robot, IoT, Online payment, Ultrasonic sensor.**

I.INTRODUCTION

In today's time when we go to restaurant, there, we have to wait for long time just to place our order because there are already so many customers waiting to place their orders and there are only few waiters present to note down the orders. Also, exactly same thing happens during delivery time. That's why one has to wait for long time to receive the ordered item.

In order to solve this issue, we have introduced the concept of automated restaurant, the restaurant in which you don't need to wait for so long, you can easily place your order from your mobile phone and get it deliver with help of Line Follower Robot.

Automated restaurant is a restaurant which works automatically in order to provide exciting, satisfying and hassle-free experience of dinning.

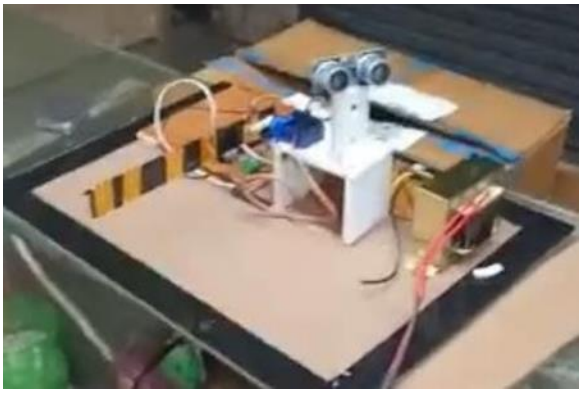
The technologies used in this project are ultrasonic sensor to make gate to open and closes it, QR code to scan the menu and order it through mobile phone so that placing order will be contactless, faster and easier. Last is Line follower robot to make an order deliver from kitchen to customer's table by following its specific line.

II. METHODOLOGY

Automated Restaurant System is primarily consisting of the following blocks.

A. Automatic door

- This block concerns with automatic opening and closing of a gate. This includes ultrasonic sensor for sensing the person approaching the gate. This system is controlled by Arduino uno microcontroller.
- A step-down transformer is being used to provide this low voltage value which is suitable for electronics supplying.
- A rectifier circuit is being used to convert AC to DC. This circuit consists of a bridge rectifier and a capacitor.
- The output generated by transmitter section of ultrasonic section will be received by Arduino based microcontroller.
- The Arduino based microcontroller circuit consists of ATMEGA 328, crystal oscillator, capacitor, reset switch and SG90 servo motor.
- On receiving the generated outputs from transmitter, gate will open with the help of servo motor and after time delay of approximately 2-3 seconds, it will get closes automatically.



Automatic Door

B. Menu ordering

Menu ordering consists of QR code. Customers can scan the QR code that will be there on their respective

tables. On scanning the QR code, a platform will open through which customers can see the detailed menu list. They can order through this platform and can also pay their bill. At the receiver end i.e., the chef can see their orders over a similar platform on a screen installed at the kitchen.

QR also known as "Quick Response." While they may look simple, QR codes are capable of storing lots of data. But no matter how much they contain, when scanned, the QR code should allow the user to access information instantly – hence why it's called a Quick Response code.

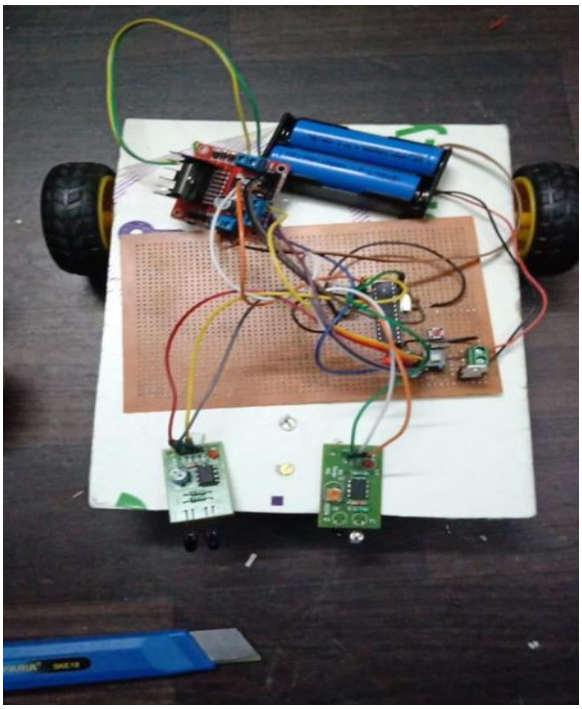
C. Food delivery system

As the chef gets the message of customers, the chef will prepare the food and place it on the line follower robot and the ordered food will be delivered by it at the respective table.

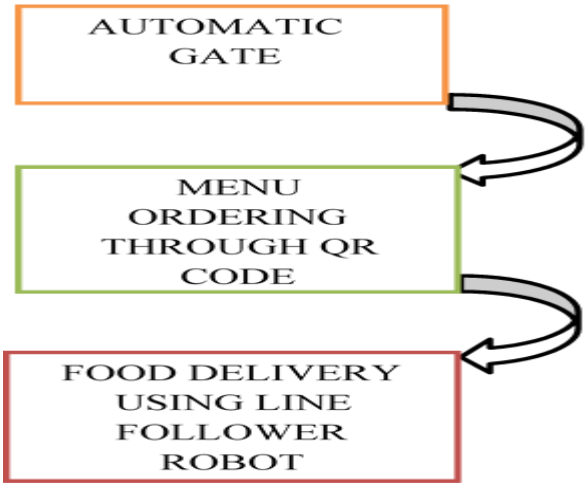
Working of Line Follower Robot

The robot is made up of following component:

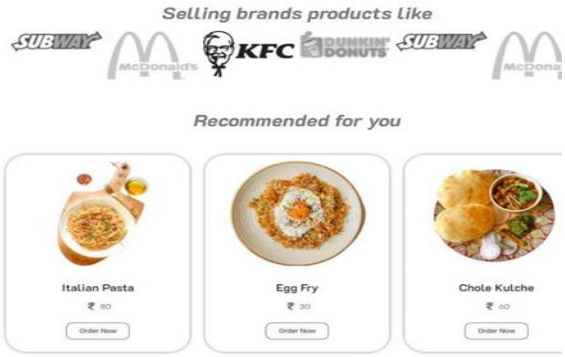
- The IR module is used to get signals from reflected waves from the surface or floor.
- A microcontroller unit which is consist of ATMEGA 328, 298 motor driver,3.7V lithium ion battery and voltage regulator is being used.
- Motor driver will receive the output generated by microcontroller unit. With the help of these signals robot will move accordingly.
- Voltage regulator is being used to convert 7V to 5V. The 7V is produced by series connections of two lithium-ion batteries.

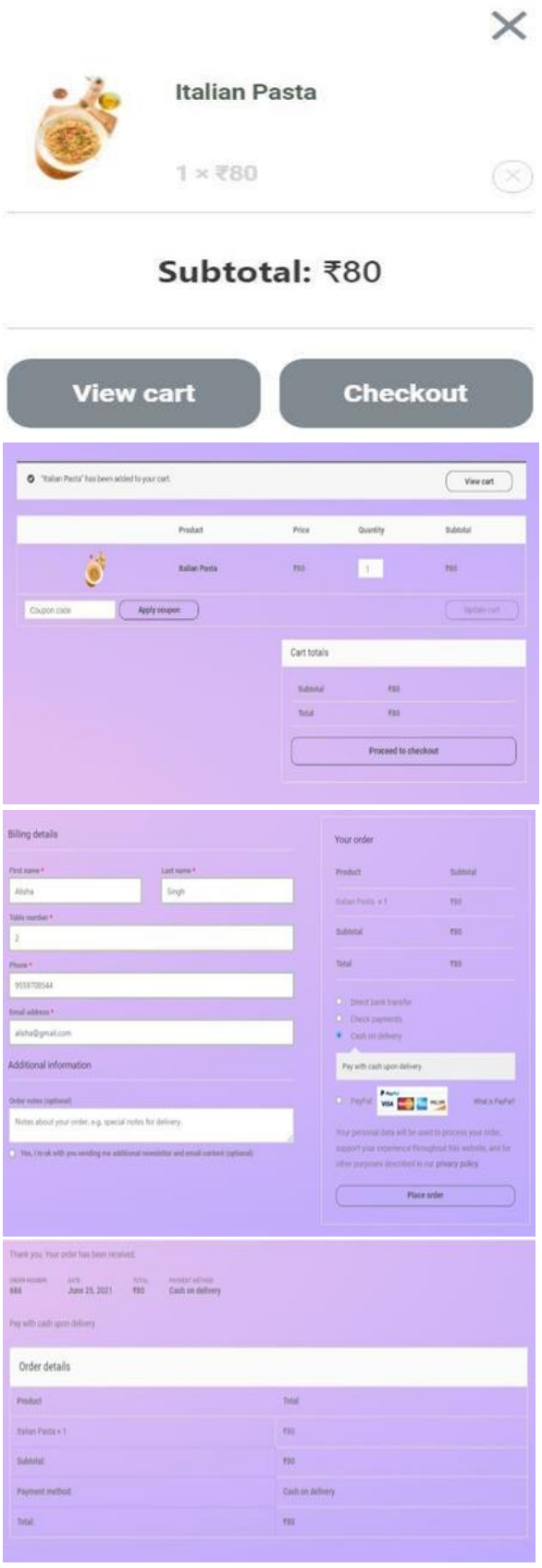


Block Diagram of whole system



D. Website Overview





III. BENEFITS OF USING AUTOMATED RESTAURANT SYSTEM

1.Streamlined Operations-
This kind of system will improve the workflow as well as effectively streamline required operations. The best thing about this system is that it immediately notifies if there are any issues with the appliances, which reduces potential risks.

2.Customer Ordering from Table-
There are at times when customers have to wait for long hours before ordering. This kind of procedure is quite frustrating for the customers too. In such situations, customers can order directly from their table with the help of IoT. They will be provided with a QR code scanner through which they can place the order directly. This way, the waiters don't have to wait for customers to order, and they can spend this time productively on other works.

3.Automation of Tasks-
Automation will help a restaurateur in various ways. like this makes it easy for the cooks, chefs, and managers to do their job. This technology will also help in finding the parts that need maintenance, shortage of any kitchen supplies, parts replacement, etc.

4.Remote Management of Kitchen-
Chef or the kitchen head can make appliances work even though they are not present in the kitchen. They can turn the oven on, turn the refrigerator off, or do so many other things remotely only.

5.Direct Bill Payment from Table-
Customers will be able to pay the bill directly by scanning the QR code at the table. There is no need for a waiter to go to the customer and wait there until he gets the cash.

IV. CONCLUSION

The concept that has been brought by us is mainly focused on changing the traditional methods of taking orders in food ordering and serving areas in hotels, restaurants, cafes, etc. thus making life easier and effective for both customers and restaurant owners in a cost-efficient manner.

With the help of IOT technology an Automated Restaurant based on digital Smart system for the restaurant is proposed to overcome the traditional method of pen and paper. The benefits of technology in business cannot be overemphasized. We incorporated this model well; automated technology forms the base for good service.

While the robots take care delivering meals to the customers, there is one attendee to interact with customers to give them an all-around experience. At the same time, they can order food by just scanning the QR code and pay for the same with QR code only.

V. FUTURE SCOPE

When technology merges itself into the everyday life of a human such that it becomes a daily part of their lives, that's when the true success of your work is considered. We are aiming to make a place that is safe, secure and most importantly healthy for the world.

There are many components which we can include to make the place safer and secure in the future. To mention them we can incorporate more robots who can help in cooking and managing at the time of rush in a place.

We can add a voice recognition module to control the lights and temperature of the place. We can also make use of smart dustbins to save nature and stop the use of other harmful materials. There are a lot of changes that we can incorporate to make a difference in the life of a human.

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