As the world moves towards new trends and technology, there is a desire to create something more appealing and beneficial for residents. This study focuses on a relatively new area of application and gives a complete review of robotics applications in the food and lodging industries. All occupations in this new technological age rely on a technique known as automation. Instead of human employees, fresh research works are being generated in the market as the trend and new interest nowadays. In this framework, we explore the notion of Food Serving Robots (FSR) or other hotel-related items. It was built using Arduino boards and the Arduino IDE. The board is predefined in this project work by employing an ultrasonic sensor, a camera, and a microcontroller.

**Keywords:** Food Serving Robots (FSR), Automation, IR Obstacle Sensor, Internet Of Things Mechanisms (IOTM).

**I. INTRODUCTION**

Currently, the Internet is expected to play a significant role in everything; new techniques are emerging in the general population to maintain precision while eliminating manual labor at a low cost. The Internet of Things is one of the moving plans to make a couple of systems as motorization and can decrease the number of human undertakings in every area, alongside this robot making and using the robot in the dares to replace the human undertakings is one of the huge thoughts. While investigating the food industry, robots fill a significant need, primarily in the service of food [1],[3]. The evolution of computerized applications in the food business grew, but it was not accessible due to expensive development charges.

Industry leaders have invested resources in cutting edge mechanics and automating developments in a push towards greater Significant capabilities and scale to tackle the concerns of what could be in the future. Fertilizer, fertilizer, collection, and duplicating structures are a few fundamental areas of advancement. Lessening production costs and monitoring water, fuel, and manure are the main focuses of these cooperative redesigns [3]. A huge number of these headways are not only helpful, but they also provide jobs. Gathering robots that can cover the areas of many personnel have been utilized by some fantastic commercial businesses. Robots fundamentally might potentially change the cycles in food planning and managing, food serving. Thus, progressing years saw enormously extended example of robot’s game plan in food region. Food serving industry is the most forward-thinking approach of robots use in food industry. This is the most imaginative locale not tapped totally as of not long ago. As this directly oversees retail and buyers, thusly, it is seen as an astounding change in lifestyle including a donning development and therefore expects watching out for the thoughts of human structure mix. Food serving industry is the most forward-thinking approach of robots use in food industry. This is the most imaginative area not tapped totally as of recently [9],[11]. As this directly oversees retail and buyers, Robotic systems have the ability to profoundly alter the cycles of food preparation, management, and service. Hence, the use of robots in the food industry was further expanded as time went on. The most innovative usage of robots in the food business is in meal service. This is the most creative area that hasn’t yet been fully utilized. It is expected to be watched for the ideas of human structure mix since this directly affects retail and shoppers. It is also viewed as a significant development and an incredible alteration in lifestyle. The most innovative usage of robots in the food business is in meal service. This is the most creative sector that hasn’t yet been fully explored [9],[11]. This directly supervises buyers and retail; Therefore, it is perceived as a radical change in lifestyle, including a sport. Particularly, we are focusing on the serving of the food in accordance with the instructions of the client, when the food is placed on the robot that is moved to the
relegated way and arrived at the table that has already been altered or trained. Once the robot is stopped at the designated table, the client can use the ringer that is contained in it. The signal emits sound until the customer receives food from the robot [13]. Using this tactic, fewer human interaction and hand meal preparation are avoided. The progression and related expectations call for keeping an eye out for the opinions.

II. LITERATURE SURVEY

Internet of Things (IoT)-based Design of an Automated Contactless E-Commerce Delivery Robot by Huang et al. The concept of an IoT-based automated delivery robot that can autonomously travel across metropolitan settings and contactless deliver items to clients is proposed in this study. (2) Zhang et al’ Smart ‘s Delivery Robots for Last-Mile Logistics: A Complete Study.” The state-of-the-art in intelligent delivery robots, including contactless e-commerce delivery robots, is thoroughly reviewed in this paper. The report assesses several delivery robot varieties and analyses the major technological difficulties in the area. (3) By Park and others, "Design of a Contactless Delivery System Using a Robotic Arm for E-commerce." In this study, a contactless delivery system based on a robotic arm is suggested for use in e-commerce applications. Through simulations and experiments, the study assesses the system’s efficacy. (4) Wang and colleagues’ "Design and Development of a Contactless E-commerce Delivery System based on the Robot Operating System." The delivery robot is controlled by the Robot Operating System (ROS) in this study’s proposed contactless e-commerce delivery system. Using simulations and tests, the research assesses the system’s efficacy. (5) By Hu et al., "An Automated Delivery Robot for Smart E-commerce Logistics." The concept of an autonomous delivery robot is suggested in this study for clever e-commerce logistics. Via simulations and trials, the research assesses the robot’s efficacy. (6) These studies show that autonomous contactless e-commerce delivery robots have the potential to enhance last-mile logistics and increase the effectiveness and convenience of e-commerce for consumers. To fully fulfil the promise of these robots, several technological and logistical issues still need to be resolved.

RELATED WORKS

Arduino Board

In addition to a project and user community, it is an open-source hardware and software company that creates and produces single-board microcontrollers and microcontroller packs for use in electronic devices. [6],[8]. Everyone can create Arduino sheets together and utilize them to provide code. The authority’s website or authorized dealers both provide Arduino sheets for quick purchase. A wide variety of microprocessors and regulators are available on Arduino boards. The sheets include a choice of intricate and straightforward information/yield (i/o) sticks that may be attached to circuits, breadboards (for prototyping), and remarkable improvement sheets (also known as "safeguards"). Sequential interchange interfaces are employed for stacking applications and are noted on the sheets along with generic serial bus (USB) on some designs [11], [15] exhibited depicted on picture 1. The preferred api known as the "Arduino language" as well as the C and C++ programming languages may be used to modify the microcontrollers. The use of standard compiler tool chains is not the most straightforward choice.

ESP32 Cam

![ESP32 Cam Board](image-url)
Motor Driver
An actual motor cause pressure is anything that motivates the motor to move in response to commands or inputs (excessive and low). To pressure a motor that needs a high entrance voltage, it uses the controller's low voltage. Device velocity control system is referred to as "motor force" or "power" in this context. Assembly lines are only one example of a commercial operation that must operate at varying costs depending on the product [7]. When process requirements call for pump or fan flow modification, changing the pressure's velocity can be more energy-efficient than other float manipulation techniques [12]. The motor driver uses a larger chip or separate fest that can regulate higher currents and voltages than the typical 5v/three.3v of a microcontroller pin with a noticeably small sign, they let you manage a sizable amount of weight. It's important to realize that the type of motor must also be taken into account when discussing motor drivers and controllers. A brushed dc motor is what the s is.

Gear Motors
A gear motor is an electric motor that has tools built into it. Gear vehicles utilize either AC (alternating current) or DC (direct contemporary) power. Under ideal conditions, the purpose of the equipment reducer is to increase the output torque that is available while keeping the motor's energy consumption low and its length short [2]. The cost of torque multiplication is a corresponding decrease in engine speed A gear motor, also known as a tools motor or geared motor, is a combination of an electric driven motor with an equipment system or gearbox [5]. Often wrongly referred to as "gears vehicles" or maybe "geared automobiles," a green motor, such as an electrically commutated motor, is paired with a gear reducer or gearhead in a gear motor. Its main objective is to ensure a smooth change from an excessive to a lower velocity without harming the system [8]. In addition to this adjustment, a tools motor is also capable of adjusting the mechanical energy of a device. A gearbox's mechanical advantage enables it to increase output torque while lowering RPM. The gearbox receives the motor shaft and uses a series of inner gears to convert the torque and velocity. We provide gearboxes in a variety of sizes and gear ratios to satisfy a broad range of torque requirements. When power and space are limited, electric driven tools vehicles are used in programs that need a high output torque and a slow output shaft rotational velocity [15]. This phrase is used to describe a broad variety of common system applications across several industries.

GSM
A device that employs GSM mobile telephone technology to offer a wireless data connectivity to a network is known as a GSM modem or GSM module. Mobile phones and other devices that communicate with mobile telephone networks utilize GSM modems. To identify their device to the network, they need SIMs.

The system is freely accessible to anyone with a GPS receiver and unobstructed line of sight to at least four of GPS satellites. A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites. Nowadays, GPS is widely utilized and has integrated into smartphones.

Table 1: Descriptions

<table>
<thead>
<tr>
<th>Microcontroller</th>
<th>Atmega328</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Voltage</td>
<td>5V</td>
</tr>
<tr>
<td>Digital input/output pins</td>
<td>8 pins</td>
</tr>
<tr>
<td>Analog Input Pins</td>
<td>6</td>
</tr>
</tbody>
</table>
Ultrasonic Sensor: An ultrasonic sensor is a piece of technology that uses ultrasonic sound waves to detect the distance to a target item and then turns the reflected sound into an electrical signal. The speed of audible sound is greater than the speed of ultrasonic waves (i.e., the sound that humans can hear). The transmitter (which generates sound using piezoelectric crystals) and the receiver are the two major parts of an ultrasonic sensor (which encounters the sound after it has travelled to and from the target).

III. BLOCK DIAGRAM AND CIRCUIT DIAGRAM

IR Sensors:
An infrared (IR) sensor is a kind of electronic sensor that monitors and reacts to ambient infrared radiation. Around 1800, William Herschel, a specialist in the field, made the accidental discovery of infrared radiation. He found that, when comparing the temperatures of each color of light, the temperature just beyond red light was the greatest (separated through a crystal). Since IR has a higher frequency than visible light, it is virtually invisible to the human eye (but it is as but on a comparable Electromagnetic range). Infrared radiation is released by everything that generates heat (that is, something that has a temperature over more or less five ranges kelvin.

Arduino IDE
It is one of the IDEs that can be used to create computer code, and those programs may be uploaded inside of physical forums in order to utilize an automated machine. This programming is really helpful and straightforward, which is why it has recently become so well-known [1],[6]. This ide layout has a lot of helpful features and settings. Integrated development environment, or IDE, is what makes it possible to write code for a physical board. It could offer an enormous range of libraries [13].

IoT
It is one of the IDEs that can be used to create computer code, and those programs may be uploaded inside of physical forums in order to utilize an automated machine. This programming is really helpful and straightforward, which is why it has recently become so well-known [1],[6]. This ide layout has a lot of helpful features and settings. Integrated development environment, or IDE, is what makes it possible to write code for a
physical board. It could offer an enormous range of libraries.

IV. EXISTING SYSTEM

The existing organizational structures of a few businesses are as follows, with the meals sector (hotels/restaurants) being particularly dependent on human labor for food preparation and service. A small number of commercial firms are investing in robots to save labor costs and for effective art production in many sectors, however serving food in hotels and restaurants still need human labor [1],[18].

V. PROPOSED SYSTEM

In response to the aforementioned issue, we will recommend a food delivery robot for the hospitality/restaurant industry [2]. This robot is prepared for only the simplest task of serving food, which makes the artwork efficient and less interrupted by humans in the method [5] shown in figure 5. It has a 6-volt battery and an IR sensor for better performance, and it can locate the designated table using the IR sensor [8] illustrated in figures 2 and 4. Whenever the user places food on the robot, it will move in accordance with the designated table. Also, it has a doorbell that might be used to receive food from the robot in the allocated customer tale, Unless the customer can take the food out of it, the buzzer will sound.

VI. CONCLUSION

The cutting-edge discovery made by the contactless food serving robot is that mechanical technology has significantly increased efficiency as compared to manual introduction systems. It has been noted that the food service industry has the greatest capacity for inventive work. The robot system can operate in accordance with the pre-described programming within the allotted time. Once the food containers are placed inside the robot's top, it can be moved to the designated table that is controlled by the user, and it can make noises until the food purchased from the customer is placed inside the table. Regarding this, the suggested robotic food supply equipment can simplify the lodges'/restaurants' approach to serving meals. This method can avoid using a meal serving gadget with a guiding system, and it can also reduce staff effort by making the process simple.

VII. REFERENCES


