

Robots in the Foodservice Industry

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Abstract: *Robots are becoming increasingly prevalent in the food service industry, as they offer a number of advantages over human workers, including increased efficiency, accuracy, and consistency. Robots can be used to perform a wide range of tasks, from food preparation and cooking to serving and cleaning. This research article will review the current state of the art in robotics in the food service industry, discuss the benefits and challenges of using robots in this setting, and identify potential areas for future research. The Hospitality industry, known for its inclination towards innovation, has been quick to embrace technological advancements. In response to the global pandemic, Hospitality businesses such as hotels, food services, and transportation have increasingly utilized robotic systems to ensure social distancing, hygiene, and sanitation measures.*

This study explores the various impacts of robotization in the sector by offering one of the first empirical accounts on the current state-of-the-art of service robotics as deployed in hospitality service encounters. The results suggest that service robots either support or substitute employees in service encounters

Keywords: Robots, food service industry, automation, artificial intelligence, robotics in food preparation, robotics in food cooking, robotics in food serving, robotics in food cleaning

I. INTRODUCTION

The food service industry is a rapidly growing sector of the economy, with global revenue expected to exceed \$1 trillion by 2025. As the industry grows, so too does the demand for labor. However, the food service industry is also facing a number of challenges, including a shortage of skilled workers, rising wages, and increasing competition. In response to these challenges, many food service businesses are turning to robotics to help them improve efficiency, reduce costs, and provide a better customer experience.

Robots can be used to perform a wide range of tasks in the food service industry, including:

Food preparation: Robots can be used to chop vegetables, mix ingredients, and prepare food for cooking.

Cooking: Robots can be used to grill burgers, fry chicken, and make pizzas.

Serving: Robots can be used to deliver food to customers' tables and clear empty plates.

Cleaning: Robots can be used to clean floors, tables, and dishes.

In recent years, technological innovations have dramatically changed the landscape of the foodservice industry. Automated machines, robots, and devices have opened up endless possibilities that previously seemed like they belonged in the distant future. Because of this, many companies are investing time and money into developing new technologies to push themselves further. We will see how new automation trends are affecting the restaurant industry, how these new technologies are being implemented, and the benefits that robots can bring to your establishment.

Restaurant automation is the use of automated or robotic devices to complete tasks throughout a restaurant. These robots can serve a variety of purposes in your workplace, doing anything from preparing meals to delivering food to your guests. It's important to note that while these robots represent the forefront of restaurant innovation, there are still limitations to what they can do. For example, a device can be programmed to cook a specific recipe, but cannot replace your chef and prepare everything on your menu.

While full automation in restaurants may seem like a distant goal, many businesses have already implemented automated technology throughout their workplace.

Robots working in restaurants have the potential to significantly improve restaurant operations. Their effects aren't limited to one particular part of a restaurant and can help to improve all aspects of the business. Distinct areas where robots are helping to improve and optimize restaurants, as well as push them forward.

The objective of this research article is to provide a comprehensive overview of the use of robots in the food service industry. The article will discuss the benefits and challenges of using robots in this setting, identify potential areas for

future research, and provide recommendations for businesses that are considering implementing robotics in their operations.

Automated Delivery:

Delivery has grown in popularity in recent years, particularly due to the proliferation of virtual kitchens and third-party deliver services. Advances in technology surrounding driverless cars, drone delivery, and several other technologies have opened the pathway to many opportunities for restaurants to update their delivery systems. By embracing these innovations, businesses can reduce delivery times and increase their output. One of the most common forms of robot food delivery:

Domino's has partnered with a robotics company to develop an autonomous pizza delivery system. The result is an automated vehicle that travels from the store to the delivery destination, keeping their customer's food hot on the way.

The benefits of food delivery robots

Ordering from these food delivery robots is cheaper, faster, better for the environment, and safer. Delivery robots appeal to the same audience that conventional delivery services do, those of us who don't have the time to eat at a sit-down restaurant or can't be bothered to leave their couch on a Friday night.

Customers seem to report overall satisfaction with their orders and bot systems get rid of the multitude of human errors that come along with ordering take out. Delivery bots would set your business apart from the competition and are an efficient way of dealing with high-demand delivery hours.

Although robots carrying orders straight to customers' doorsteps seem like a thing of the distant future, implementing a robot delivery system for your foodservice establishment is an incoming reality that could provide a boost to your delivery services.

Restaurant Robot Waiters

A waiter's job is difficult. Taking and delivering orders, keeping track of checks, and maintaining quality customer service are all things a server is constantly juggling. That's where robot waiters come in, to help simplify the workload of a waiter. Robot waiters are actually being tested at restaurants in several parts of the world.

Working of robot waiters

The system is simple, order via a tablet that sends your table's order to the kitchen, then a server plates your dishes onto a corresponding robot that acts as a runner for your food. These robot waiters can even carry drinks and checks back and forth from your table to the kitchen.

Currently being put into use at several restaurants in the U.S., these robot servers aren't meant to outright replace waiters but are merely a much-needed helping hand.

The benefits of robot waiters

Ideal for picking up the slack and heavy lifting of a server's day-to-day, these robot waiters are extremely efficient during lunch hour rushes or busy weekends. This allows for waiters to have more time to dedicate to customers and provide a better experience at your restaurant.

Having a robot server buzzing around your foodservice establishment brings in an entertainment aspect for guests, who are sure to enjoy interacting with the bots. Plus, customers will appreciate how much smoother and faster their dining experience is having a robot companion delivering their delicious meals and checks to them.

Restaurant kitchen automation

Most kitchen robots excel at completing simple, repetitive tasks. If utilized correctly, they can help to reduce the amount of time-consuming and low-skill tasks in your workplace, allowing you to optimize your staff and reduce human error. Some common tasks that robots can complete in kitchen include:

Flipping burgers

Mixing spices

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Prepping foods
Operating fryers

Keeping ingredient portions uniform

It's important to note that although these technologies can save you time, they may not be able to troubleshoot or solve errors on their own. Additionally, robots may not pick up on certain traits that a human can. For example, a robot may not be able to identify blemishes on foods, or discoloration in fruits or vegetables. For that reason, it's important to make sure you have a team of employees that can oversee and manage your automated devices.

Restaurant Automation Reduce Labor Costs?

A significant factor affecting the popularity of restaurant automation is rising labor costs, and by extension the rising cost of maintaining a restaurant in general. While the price of automation may be expensive at first, its price will drop as the technology progresses and becomes more common in the foodservice industry. Beyond their ability to complete tasks without being paid, robots offer several other benefits that can help reduce expenses. These benefits include:

Improved training: The restaurant industry features a high rate of employee turnover, meaning that the time invested in training new hires can quickly go to waste if they choose to leave their job. By utilizing automated training protocols and videos, managers can reduce the amount of time they spend on training and complete other tasks instead. As a result, the cost of training is reduced.

Automated task management: By automating simple tasks throughout the workplace, employees will have more time and flexibility to take on other responsibilities. Additionally, automation makes it easy to display the tasks that your employees are working on and highlight things that need to get done. This can result in improved task management, making your business more cost-efficient.

Efficient inventory management: One of the leading contributors to increased spending in a restaurant is poor inventory management. Automated inventory systems make it easy for your employees to scan and track items and ingredients in your kitchen, saving them time and helping you to reduce waste.

II. REVIEW OF LITERATURE

There has been a growing interest in the use of robots in the food service industry in recent years. A number of studies have been conducted to examine the benefits and challenges of using robots in this setting.

One study found that robots can significantly improve the efficiency of food preparation tasks. For example, a robotic pizza maker can produce a pizza in less than two minutes, compared to five minutes for a human worker.

Another study found that robots can help to reduce food waste. Robots can be programmed to prepare food to exact specifications, which can help to reduce the amount of food that is overcooked or undercooked.

However, there are also some challenges associated with using robots in the food service industry. One challenge is the cost of robots. Robots can be very expensive to purchase and maintain. Another challenge is the complexity of food preparation tasks. Some food preparation tasks, such as cooking meat and vegetables, can be difficult to automate.

Scope for Study:

This research article will focus on the following areas:

- The benefits and challenges of using robots in the food service industry
- Potential areas for future research in robotics for the food service industry
- Recommendations for businesses that are considering implementing robotics in their operations

III. CONCLUSION

Robots offer a number of advantages over human workers in the food service industry, including increased efficiency, accuracy, and consistency. However, there are also some challenges associated with using robots in this setting, such as the cost of robots and the complexity of some food preparation tasks.

Overall, the use of robots in the food service industry is still in its early stages of development. However, as the technology continues to improve and costs come down, robots are expected to play an increasingly important role in this sector.

Restaurant automation has changed the foodservice industry for the better. Money is being saved, tasks are being streamlined, and new jobs are being introduced.

The future of the restaurant industry lies in automation. A.I. technology and its corresponding robots are providing solutions to everyday problems. As a restaurateur or foodservice establishment owner, it's important to always take a look at what areas of your business could need improvement. With the evergrowing developments in science and software, it's hard not to imagine a future that doesn't include technological companions.

To bridge the gap between any issue business faces, investing in these innovative robots might be the answer. Although robots can't replace entire human staff, they can help carry the weight of busy hours and understaffed days. Whether it be robotic arms cooking alongside you, automation is quickly becoming a part of the restaurant industry.

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