



Automation Innovation

Cobots and Other Technologies for Your Kitchen

FOOD PROTECTION CONNECTION



Robots in your kitchen may help you increase efficiency and enhance food safety

What would you do if a résumé came across your desk for a foodservice worker that read like this?

I am dependable—I never take a sick day and don't go on vacation.

I am polite and always say excuse me.

I will memorize your kitchen layout and move with maximum efficiency side-by-side with my co-workers.

I don't expect to be paid for overtime—in fact, I work for free.

I will never raise an HR complaint or cause a labor dispute.

I am not a member of the union.

I don't require any training.

I never make a mistake.

I work safely and never get hurt.

I clean up after every task.

Food safety is my top priority.

I'd say, "You're hired!" This is the future of foodservice robotics.

AUTOMATION: PAST, PRESENT, AND FUTURE

Food-centric robots are gradually making an entrance into the industry, offering options for completing tasks more economically and efficiently than human counterparts. Robotic technologies, artificial intelligence (AI), and other technological developments are among some of the latest innovations being adopted in commercial kitchens to increase efficiencies and uniformity, drive sales, bolster food safety, and automate the foodservice industry.



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Now, before you say, “this is crazy,” robots are not taking jobs away from humans quite yet, but they sure are playing a key role in advancing the future of dining in multiple ways.

Automation exists to improve the quality of human lives. This is not a new concept. We have been trying to automate food service for a long time. The idea of replacing servers and kitchen staff may sound futuristic, but in fact vending machines began dispensing food as early as the late 1800s. The first successful attempt at full automation in food service took place in Berlin, Germany in 1895 and it was called Quisisana. Quisisana was an **automat**, which is essentially a quick-serve, unmanned restaurant where simple foods and beverages are served by multiple vending machines (before there were fast food restaurants). By 1902, Horn and Hardart opened the first automat in the United States in Philadelphia, Pa. In the U.S., automats were an East Coast phenomenon. Proponents of restaurant automation have long argued that it is more sanitary and efficient, and results in lower prices for customers.

The greatest success of automats was their

experimentation with cutting-edge automation machinery and production techniques, which allowed fresh-made dishes to be offered at affordable prices to thousands of customers each day. Later, the focus shifted to the elimination of kitchen personnel through streamlined food preparation and mechanized tasks ensuring predictable results with standardized portions, consistent product, and fast cooking times. Temperature-controlled glass door compartments allowed the customer to ‘window shop’ their meal and select whatever their stomach hungered for. Automats were wildly popular in their heyday, however the emergence of fast food restaurants gradually phased out this service style for the novelty of new, better, and different options. Philadelphia’s last automat closed its doors in 1991. Today, automats continue to thrive overseas in the Netherlands, where there is a popular chain called FEBO, and are also found in Japan.

MEET THE ROBOTS

A cobot or co-robot (collaborative robot) is a robot designed to physically interact with human coworkers. Meet some of

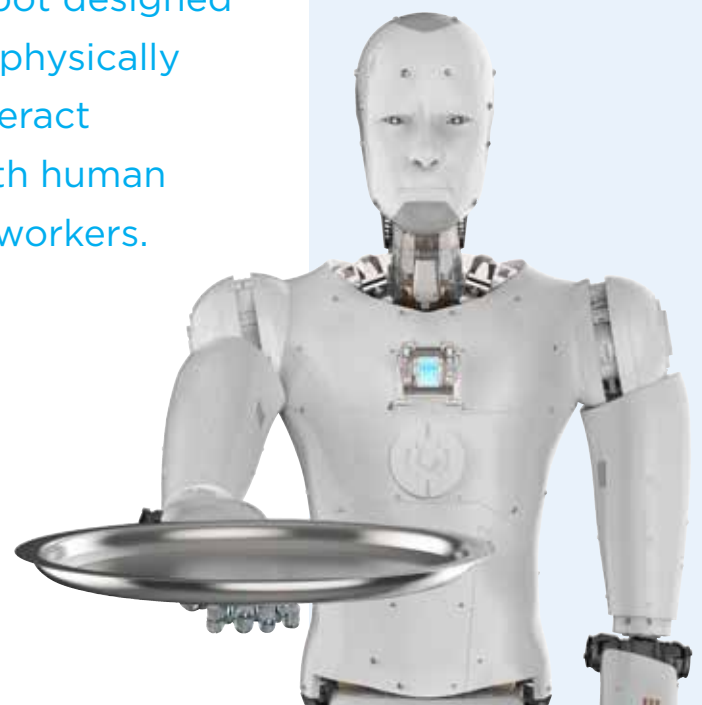
the cobots that may change the face of foodservice operations.

Flippy

Developed by Miso Robotics, Flippy is the first intuitive robotic kitchen assistant—referred to as a cobot because it can work alongside humans. Flippy grills, fries, prepares, and plates food, and can even take product temperatures with built-in thermal “eye” sensors and has real-time decision-making capabilities. Flippy is unique in that it’s not just a task functional

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A cobot is a robot designed to physically interact with human coworkers.



robot, through AI Flippy is aware and responsive to the changing dynamics of the kitchen environment and actually learns new skills and continuously improves over time—a somewhat frightening and yet extremely promising development in technological advancement. Flippy automatically switches tools for raw and cooked products and cleans up after itself (tools and the grill). Additionally, Flippy is OSHA safety compliant and is fully wipe/wash-down compatible. This makes Flippy the ideal employee from a food safety standpoint!

Sally the Salad Robot

Developed by Chowbotics Inc., Sally is a freestanding vending machine robot that prepares about 1,000 different customized salads from 22 refrigerated fresh ingredients that are precisely and accurately measured using nutritional data programmed into the robot in less than 60 seconds. Sally also prepares yogurt parfaits and grain bowls with plans to expand her culinary repertoire in the future. An additional benefit of Sally is that she is much more hygienic than salads prepared by human hands or even worse, a self-service salad bar where germs abound. And,

Sally reduces the chance for cross-contamination, making it a safer choice for guests with food allergies. The ingredients still require human preparation and restocking of the unit. Chowbotics notes that Sally also offers an “eat-o-tainment” opportunity to watch your salad be assembled in front of you by a machine.

Bruno, Pepe, Giorgio, and Vincenzo

Zume Pizza is a largely robotic operation backed by AI with locations across the San Francisco Bay area. Humans still top the pizzas here, but Bruno loads pizzas into the oven, Pepe and Giorgio are the sauce bots, and Vincenzo eliminates the dangerous human task of removing hot dough from the 800 degree oven.

Motoman SDA5/ Suzumo Sushi Chef

This robotic sushi chef can roll up to 3,600 pieces of sushi, nigiri, or maki per hour, far surpassing its human counterparts’ productivity.

Froyo Robot

Like Redbox disrupted the video store, the Froyo Robot—developed by Generation Next—may ruin self-serve frozen yogurt shops. The vending robot can dispense

seven flavors of Dannon YoCream and six different toppings almost anywhere, providing customers a fully customizable frozen sweet treat without any human involvement.

Spyce

In 2018, four M.I.T. graduates opened this Boston restaurant that is comprised of a self-cleaning robotic kitchen that can prepare a meal in under three minutes and is approved by the National Sanitation Foundation (NSF).

Wall-E

In China, this completely human-free restaurant consists of 30 robots that process orders and payments, prepare and cook the food, and serve it to customers.

OTHER AUTOMATED TECHNOLOGIES ENHANCING FOOD SERVICE

The Internet of Things (IoT) is defined as *the extension of internet connectivity into physical devices and everyday objects*. IoT connects machines, devices, objects, people, and animals to one another by transferring data over a network without requiring human-to-human or human-to-computer interaction, but

THE FIRST WAVE OF AUTOMATION

has squarely hit the front of the house with many popular brands we dine at regularly utilizing automation and other disruptive technologies...

rather providing each with unique identifiers (UIDs) and sensors able to capture and transmit data. IoT will allow industries including food service to become more efficient, automated, and safer, and have farther reach and increased connectivity, all providing greater overall value to the consumer.

According to the National Restaurant Association, the first wave of automation has squarely hit the front of the house with many popular brands we dine at regularly utilizing automation and other disruptive technologies to change the traditional model of food service including order placement and payment innovations (i.e. kiosk, remote—like phone apps and voice—think *Alexa*) as well as self-serve and pick-up options (i.e. lockers and beacon/spotlight systems) to name a few. However, as the automation curve continues, the back of the house in commercial kitchens is the next likely target ripe for technological innovation.

THE LABOR SHORTAGE AND TECHNOLOGY

According to the U.S. Bureau of Labor and Statistics, unemployment is at a half century low. Not since 1969 have we seen the rate below 3.6 percent, which is what was reported in April 2019. The restaurant industry has long faced a labor shortage. The lowest paying, menial, entry-level tasks of food service have been a hard sell for many years. However, only recently, has this issue crossed the divide into healthcare food service. For many years, healthcare and institutional foodservice operations did not face the same labor shortages seen in the rest of the industry because hours of operation were more humane, pay was better, and most importantly, benefits were offered.

Minimum wage increases for lower-skilled workers at large corporations like Amazon and Walmart are making the competition for talent much more difficult for foodservice operations. Sure, menus can be pared down and simplified and cross training provided to every new hire, but this does not appear to be enough to fill the void. Some companies are going beyond traditional hiring practices and offering sign-on bonuses for food prep workers and cooks; doing social media hiring campaigns; throwing “hiring parties” with food and beverage for attendees; and offering applicants the opportunity to “make your own schedule” as enticement methods, in hopes of filling vacant positions.

While automation will not replace or eliminate human jobs entirely, it will most definitely affect a portion of almost all jobs to some degree. According to the McKinsey Global Institute, the service sector that is most likely to see automation due to its technical potential is food service and hospitality, with 73 percent of activities performed by human workers in this segment having the potential for automation due to the high level of predictability of tasks and operation of machinery. Some of the tasks that are prime for automation include: preparing, cooking, portioning, and serving foods and beverages; cleaning and sanitizing food and non-food contact surfaces; collecting and ware washing dirty dishes; and putting away clean dishes.

Technology isn't replacing foodservice workers, it's filling an expanding void in the labor market, allowing food service to streamline operations and deliver true value to customers.

A McDonald's spokesperson stated bluntly, “the tremendous margin of human error, poor hygiene, lack of education, and laziness” as reasons to move towards automation in food service.

However, just because an activity can be automated, doesn't mean it *will* be. Other factors must be taken into consideration with automation including:

- The cost of development and deployment of hardware and software
- The cost, availability, and skillset of labor
- Other benefits, like higher output through increased speed; improved quality, accuracy, and product consistency; fewer errors; and a safer work environment
- Regulatory and social factors related to technology acceptance

FOOD SAFETY

A slew of self-cleaning kitchen innovations have already entered the market to assist in commercial kitchens to reduce labor and improve food safety and sanitation. Self-cleaning ovens; cook-and-hold units allowing unstaffed product preparation; labor-saving dish machines that are more effective, simpler, and result in better cleaning

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abilities; and robots that clean utensils, grills, workspaces, and floors.

Employees are the greatest asset and greatest risk in any foodservice operation. Reduced contact with human hands can reduce pathogen transfer. And, advancements may soon give robots the ability to detect pathogens in the foods they are preparing.

FUTURE OUTLOOK

If (or when) computers gain the ability of insight and can understand human language and comprehensively recognize everyday communication and interaction between people, the technological breakthrough would revolutionize the foodservice industry.

Advanced equipment technologies, AI, robotics, and the IoT will cause rapid paradigm shifts in foodservice operations across the entire supply chain. Determining what is available, viable, and meets consumer expectations will be the biggest challenges moving forward. Technology advances at such a fast rate that it keeps a lot of people on the shore and prevents them from jumping in the water, for fear of not being able to amortize the technological costs before they become obsolete (think about the exorbitant cost of VCRs and video cameras when they first hit the

AS CONSUMERS BECOME MORE COMFORTABLE WITH TECHNOLOGICAL INTERACTION, the wariness of robots and other automations will wane, allowing food service to tap into innovation that will better meet customer expectations.

market—then recall the price just a few short years later—pennies on the dollar). Understanding rapidly-changing customer demands will drive the appropriate technologies for your foodservice operation because ultimately, the customer is our business, so we need to provide the best solution for them in order to be successful.

As consumers become more and more comfortable with technological interaction, the wariness of robots and other automations will wane, and the ability of food service to tap

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into technology and innovation will create a successful platform to meet customer expectations which are rising by the day. Only the future knows what will happen, but don't be surprised if you look out into

your commercial kitchen in the not so distant future and see humans working side-by-side with their cobots. **E**

SAN CE Questions | FOOD PROTECTION CONNECTION



This Level II article assumes that the reader has a foundation of basic concepts of the topic. The desired outcome is to enhance knowledge and facilitate application of knowledge to practice.

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1. What does IoT stand for?
 - A. Internet of Time
 - B. Interspatial Ordinance of Things
 - C. Internet of Things
2. Which is *not* a foodservice robot currently in operation?
 - A. Sally
 - B. Bruno
 - C. Huey
3. The first Automat was located in _____.
 - A. The Netherlands
 - B. Berlin
 - C. Philadelphia
4. The foodservice and hospitality industry has the potential to see what percentage of automation, according to the McKinsey Global Institute?
 - A. 73 percent
 - B. 91 percent
 - C. 37 percent
5. The first wave of foodservice automation and disruptive technologies have focused on front of the house tasks and processes.
 - A. True
 - B. False
6. In regard to food safety, which of the following does Flippy the robot *not* do?
 - A. Mop floors
 - B. Switch utensils between raw and cooked product
 - C. Clean the grill
7. Technology and automation in food service is *not* _____.
 - A. Filling an expanding void in the labor market
 - B. Replacing foodservice workers
 - C. Allowing food service to streamline operations and deliver true value to customers

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