by Chrissy Carroll, MPH, RD

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Artificial Intelligence

The Future of the Foodservice Industry?

MANAGEMENT CONNECTION

AI is addressing challenges across many aspects of foodservice management

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While artificial intelligence (AI) sounds like something out of a sci-fi flick, you may be surprised that you probably encounter it regularly. From carefully curated social media feeds to digital voice assistants (i.e., Siri, Alexa) to navigation apps that can reroute you through real-time traffic—AI is already part of our daily lives.

But when it comes to our jobs, is there a place for artificial intelligence? Most people envision AI in Silicon Valley startups and big-name tech companies, but we are likely to see it enter the foodservice space at increasing rates. Innovative AI technology can address challenges across many aspects of foodservice management, from marketing to operations.

What does this mean for you as a foodservice professional? Let's take a look.

WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence is a broad term that can be used to describe any computer activity that mimics human thought. AI programs are designed to process information and make decisions.

AI technology has evolved over time from being able to solve simple problems to more complex tasks, like recognizing language or implementing complicated algorithms. Advanced AI technology may be designed to make decisions without

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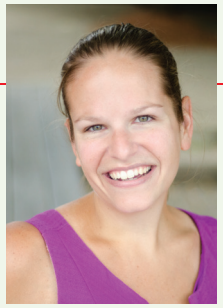

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any human input at all—a concept that for most people is simultaneously fascinating and perhaps a little frightening.

WHAT ARE THE BENEFITS?

The benefits of properly implementing artificial intelligence technology include:

- Automation of certain tasks, leading to higher production rates while reducing labor costs
- Improved quality control by reducing fatigue-based errors (a computer is less likely to get tired and make a mistake compared to a human)
- Reduced employee turnover due to more efficient workflows
- In the realm of health care, potentially improved patient care

AI IN FOOD SERVICE

The foodservice industry is rapidly changing, and many believe it will be one of the industries most impacted by AI. Here are some examples of potential uses:

SELF-SERVICE KIOSKS help reduce wait time, increase customer comfort with customized orders, and allow diners to view nutrition information.

Self-Service Kiosks or Tablets

You've probably visited a restaurant in the last few years that had self-service kiosks or tablets on the table for ordering. These can help reduce wait time, increase customer comfort with customized orders, and allow diners to easily view nutrition information for their dietary needs.

And while this technology is impressive in and of itself, additional AI can create more functionality.

For example, facial recognition technology can remember what you ordered last time, making personal suggestions for your next order. BurgerFi, a restaurant chain in South Florida, uses this technology in some of its locations.

While this type of AI is more prevalent in commercial food service, there could be future implementation in organizational settings. For example, facial recognition could be implemented in hospital or long-term care settings, allowing dietary preference history to quickly surface upon admission.

Staff Management

Many of us probably have memories of staff scheduling that was done by hand and pinned to a corkboard. These days, managing staff schedules is much easier thanks to digital software.

As this type of software advances with AI technology, you'll see even more functionality. AI can monitor

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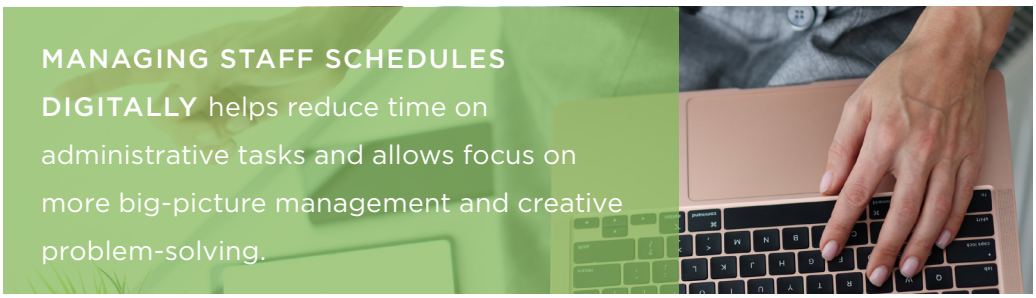

MANAGING STAFF SCHEDULES DIGITALLY helps reduce time on administrative tasks and allows focus on more big-picture management and creative problem-solving.

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busyness throughout days/months/years, and start to pick up on trends, predicting when you may need more staff on hand and adjusting employee scheduling accordingly.

By reducing your time on administrative tasks related to staff management, it frees you up to focus more on big-picture management and creative problem-solving.

Food Preparation

In organizational food service, following standardized recipes is essential for two reasons: inventory management and nutritional needs.

AI may allow for faster and more accurate preparation of standardized recipes. For example, building a database of recipes into a voice-powered platform (like Alexa) could allow kitchen staff to quickly access any recipe. AI could also make quick adjustments to recipes for various yields and instruct staff on such preparation instructions.

Menu Planning

Researchers have been attempting to computerize menu planning since the 1960s, but the complex factors involved—like nutrition needs, appropriate food pairings, food preferences, etc.—make it quite difficult.

New artificial intelligence technology could make this a reality in the future though. For example, a menu tool might utilize AI with incremental learning technology, which is guided by a CDM, CFPP at first. As the computer "learns" about the decision-making processes via a CDM, CFPP's choices, it can build code-based reasoning into its menu design, relying less on human interaction to create future menus.

Dietary Screening and Nutrition Care

Recent partnerships between healthcare companies and technology firms illustrate an interest in artificial intelligence for patient care, including nutrition. For example, in 2021, Mayo Clinic teamed up with two tech start-ups with the goal to build and commercialize artificial intelligence tools for the healthcare industry.

This technology is still in its infancy, but in future years we could see AI being used to predict nutrition risk level or assist in aspects of managing nutrition care. Several recent studies, for example, have used image-based artificial intelligence analysis of meals before and after consumption. The technology was able to estimate nutrient intake, which could help identify patients at risk for malnutrition.

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Robot Food Production

Yes, it sounds like the plot of a science fiction novel, but robot food production is becoming a reality in some establishments.

For example, Sally is a salad-making robot created by Chowbotics that first debuted in 2017. Not only does Sally prepare salads, but it also intelligently tracks ingredient usage data with a cloud-based portal, so you can better optimize inventory and reduce food waste. This robotic system can be placed anywhere in your facility (it's like a salad vending machine), and can even integrate with employee badges for quick payment.

Another example is Flippy, developed by Miso Robotics. This is an AI-powered frying assistant which automates any fried food production, reducing labor costs over time. It can also provide insights into oil and product usage.

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Inventory Management

AI technology will almost certainly be able to assist in inventory management in the future. For example, systems may be developed to analyze room-service style orders and compare it to current computer-tracked levels of inventory. If low stock is detected, AI can make decisions to either add that to an order list, or potentially even order it directly from your vendors.

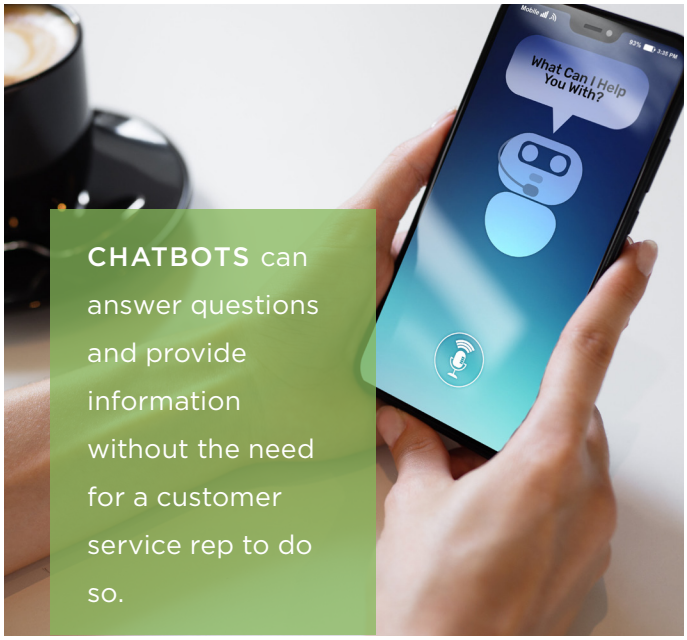
Perhaps even more innovative, there are now AI-enabled trash bins that are being introduced to the market. These bins photograph food that's being thrown away, and use a computer algorithm to calculate the financial impact. This can help an organization make better decisions about inventory management in the future. One such product, the Winnow Vision, estimates that it can cut food costs by 2-8 percent per year.

Customer Service Chatbots and "Digital Humans"

When customers visit a website—most commonly restaurants, but feasible for any consumer-facing site—they may be able to chat with a customer service bot that uses AI to help answer questions.

For example, a family member may visit a long-term care facility website and type "What is this month's menu?" into the AI-powered chat, and the AI bot is able to produce a link or file that contains that month's menu.

This can improve efficiency for both the organization and customers, as the AI chatbot can answer questions and provide information without the need for a customer service representative to do so.

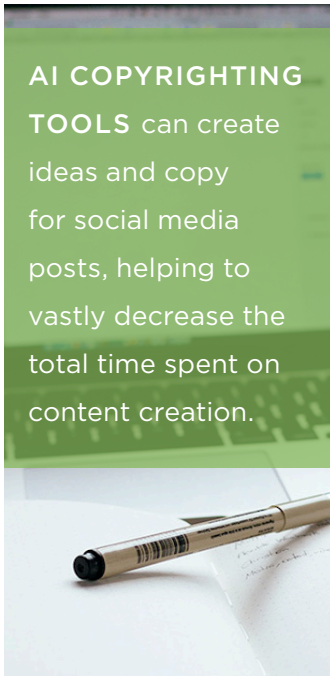


CHATBOTS can answer questions and provide information without the need for a customer service rep to do so.

One example in the commercial setting is Nestlé's digital human named Ruth—a "Cookie Coach" that's able to answer baking questions digitally via chat or microphone. Ruth can help walk people through a recipe, troubleshoot problems, or adjust recipes for dietary preferences.

Social Media Content Creation

You are probably aware that social media can be vastly important for commercial operations, but certain organizational foodservice programs also benefit by having a strong social presence.



AI COPYRIGHTING TOOLS can create ideas and copy for social media posts, helping to vastly decrease the total time spent on content creation.

For example, a school foodservice program could share content like monthly menus, fun food facts, and nutrition tips to engage with the families of the students they serve. Similarly, a corporate wellness program at a large hospital might utilize a Facebook group to share health tips and upcoming events with employees.

But what if there was a way to create social media content without excessive time dedicated to the task? That's where artificial intelligence comes in handy. AI copywriting tools (for example, Jarvis.ai or Peppertype.ai) can create ideas and copy for social media posts, helping to vastly decrease the total time spent on content creation.

Food Safety Compliance

When it comes to foodborne illness, it's essential for companies to put proper food safety protocols into place to reduce risk. AI can potentially be used in this area too.

For example, in China, an AI tool called KanKan has been used to determine whether foodservice workers are wearing mandated hats and masks. The system uses video monitoring with object and

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facial recognition to determine those in violation of rules throughout their shift.

Another interesting use of AI in food safety is in fish fraud. Tellspec produces a portable sensor that can be used on fish to detect instances of fraud (like purchasing seabass but really being sold tilapia) and nutritional value. This is less practical at the kitchen level, but could be used by vendors to ensure proper sourcing.

AI Concerns

Despite the incredible technological advances, there are some concerns about the use of AI in food service.

Some experts believe we're not sufficiently prepared to address the ethical implications and cyber security concerns of AI at large scale. For example, do consumers feel comfortable with facial recognition software simply to grab a burger? Can organizations properly safeguard sensitive personal health information when utilizing AI?

There are also concerns over how AI may affect jobs as more organizations begin using automation technologies for tasks previously performed by workers. It may be difficult for people who have been displaced by robots to find new positions.

Ideally, the goal with artificial intelligence should be gradual implementation. Individuals who are set to lose tasks to AI should be provided opportunities to learn new skill sets.

Also, keep in mind that AI and better automation do not necessarily eliminate the need for an employee. For example, in the case of Sally the salad robot, you still need employees to prepare the ingredients that go into the machine, and you still need employees to clean it.

Lastly, cost and resistance to change are both prohibitive factors to implementing AI. Upgrading to new technologies can be expensive, and companies may not have the capital necessary to make these changes. In addition, both employees and customers may be hesitant to adapt to change, which can make the implementation process difficult.

FINAL THOUGHTS

Artificial intelligence presents both benefits and concerns in our industry. One thing is clear: with technology advancing at an unprecedented pace, there will almost certainly be opportunities to use some of these AI technologies in the future (including those that haven't even been invented yet)! Be open to learning about these technologies, even if they seem overwhelming at first, as they may enhance both operations and nutrition care. E

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1. Which of the following is the best definition of artificial intelligence (AI)?
   A. Computer activity that mimics human thought
   B. Computer systems only utilized by technology companies
   C. Computer algorithms that can solve simple (but not complex) problems
2. Which of the following is *not* a benefit of artificial intelligence in food service?
   A. Improved automation
   B. Improved quality control by reducing fatigue-based errors
   C. Reduced cyber-security concerns
3. A menu planning system that utilizes a human's input first, and then develops code-based reasoning in response to this, is using a type of technology called:
   A. Computer success technology
   B. Incremental learning technology
   C. Ionic band technology
4. Which type of AI described in the article could help identify patients at risk for malnutrition?
   A. Voice-powered digital assistants
   B. Image-based analysis of meals before and after consumption
   C. Tellspec sensors
5. How could an AI *copywriting* tool be useful in foodservice management?
   A. Create social media post ideas for school food service
   B. Determine staffing needs for hospital food service
   C. Conduct dietary needs assessments for long-term care
6. Utilizing an AI-powered trash bin is estimated to reduce food costs by what amount?
   A. 2-8 percent
   B. 8-15 percent
   C. 15-20 percent
7. Which of the following is likely the best next step when an employee's task will be taken over by AI?
   A. Let go of the employee immediately to save on labor costs
   B. Stop using the AI system to preserve all jobs
   C. Give the employee the opportunity to learn new skill sets