

PUBLICSECTOR CATERING

CATERING TECHNOLOGY OF THE FUTURE

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Introduction

Diets change over time, food fads come and go, and previously niche regional ingredients become global staples. To deal with these changes and to support much-needed moves to reduce the carbon footprint of catering, commercial kitchen equipment is going through its own technological revolution.

So, what will the kitchen of the future look like?

This guide aims to fast-forward ten years to give you an idea by taking the cutting-edge and futuristic ideas that are being talked about and trialled now and imagining how they will be used by chefs and KPs in 2034.

There are examples of technology being incorporated into cooking and serving food that point the way forward. The Hajime Robot Restaurant in Bangkok, Thailand sees Hajime robots serve every guest their food, while at closer to home at Inamo restaurant in London customers use a touch screen on tables to order food.

To give you just a taste of what this might mean, global services company Sodexo recently explored the future of food services at the Consumer Electronics Show in Las Vegas. The top five trends identified were:

- Artificial Intelligence magic unleashed: Plates automatically scanned after meals to reduce food waste
- Sustainability by design: Decarbonised refrigerants for food transportation
- Robots in the kitchen: Robots helping craft dishes compatible with menus
- Food tech rising: Automated cocktail machine
- Health tech and wellbeing: HappyBase for self-development with an AI coach

Public Sector Catering has looked at these and many other ideas and talked to futurists and commercial kitchen manufacturers to offer a glimpse into the future.

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SECTION ONE

FIRST, ASK THE MACHINES

To get an idea of the sort of technology we might see in the kitchen of the future, why not use technology itself? So we challenged Microsoft's ChatGPT, an AI chatbot, to give us its view of the equipment that commercial kitchens will be using based on diet trends, the demand for greener and more sustainable menus, and a continuing lack of staff. Here is its report



Automated Cooking Appliances

The kitchen of the future will likely feature advanced, automated cooking appliances that can handle various tasks without constant human supervision. Smart ovens, robotic chefs, automated stirring and chopping devices will enable efficient meal preparation, reducing the need for a large kitchen staff.

AI-Powered Menu Planning

Artificial Intelligence (AI) will play a crucial role in planning menus that are not only delicious but also sustainable. AI algorithms can analyse trends in eating habits, nutritional requirements and environmental impact to create well-balanced and eco-friendly menus, addressing the growing demand for sustainable dining options.

Robotics for Food Preparation

Robotic kitchen assistants will take on the responsibilities of chopping, dicing and other repetitive tasks, ensuring precision and consistency in food preparation. These robots can work continuously, mitigating the effects of staff shortages and improving overall kitchen efficiency.

Smart Inventory Management

The kitchen of the future will utilise smart sensors and inventory management systems to track ingredient levels in real-time. This technology will help reduce food waste by ensuring that chefs only order and use the necessary ingredients, while also allowing for better planning to cope with fluctuating demand.

Vertical Farming and In-House Gardens

To address the demand for greener and more sustainable menus, kitchens may incorporate vertical farming systems or in-house gardens. Fresh produce can be grown on-site, minimising the environmental impact associated with transportation and providing chefs with immediate access to high-quality, locally sourced ingredients.

3D Food Printing

3D food printing technology will revolutionise the presentation of dishes and allow for customised textures and flavours. Chefs can create intricate and artistic food designs, meeting the expectations of diners who seek unique and visually appealing culinary experiences.

Augmented Reality (AR) Dining Experiences

Augmented reality will enhance the dining experience by overlaying digital information on real-world surroundings. This technology can be used for interactive menus, virtual cooking demonstrations, and immersive storytelling about the origins and sustainability of the ingredients used in each dish.

Drones for Food Delivery

To adapt to eating out trends, the kitchen of the future may employ drones for efficient and contactless food delivery. This not only meets the demand for convenience but also reduces the need for additional front-of-house staff, making the overall dining experience safer and more streamlined.

Waste Reduction Technologies

Sustainable practices will be a priority, with the integration of waste reduction technologies such as composting systems, biodegradable packaging, and recycling stations within the kitchen. These initiatives align with the growing consumer focus on eco-friendly dining options.

Blockchain for Supply Chain Transparency

To ensure the provenance and sustainability of ingredients, kitchens may implement blockchain technology in their supply chain. This will provide diners with transparent information about the sources of their food, supporting the demand for ethical and sustainable dining.

Conclusion

In summary, the kitchen of the future will be a highly automated and technologically advanced space, utilising AI, robotics and sustainable practices to meet the demands of changing eating habits, staffing challenges and the growing emphasis on environmentally friendly dining options.



SECTION TWO

ARTIFICIAL INTELLIGENCE

The integration of Artificial Intelligence (AI) and robotics into catering operations is poised to revolutionise the industry by 2034, and the changes have already started ...

AI has already started making its way into various industries, including catering, and in the coming years is expected to revolutionise how commercial kitchens operate.

AI-powered systems can enhance efficiency, accuracy, and consistency in food preparation and service.

Heko Smart Kitchen, an Italian company specialising in electric induction kitchen units, uses the technology in its operations and has already explored how that will mean for chefs and caterers. Here are some key ways AI and robotics could transform catering equipment and operations:

- **Enhanced Food Safety:**

AI can be used to monitor food quality and detect potential contaminants. This technology can also track food temperatures, ensuring that perishable items are stored at safe temperatures to prevent foodborne illnesses.

- **Streamlined Ordering and Payments:**

With the help of AI, restaurants can automate the ordering and payment process, allowing customers to place orders through voice commands or mobile devices. This convenience can improve the overall dining experience and increase efficiency for both the restaurant and customers.

- **Data-Driven Decision Making:**

By analysing data from various sources, AI can provide valuable insights to help restaurant owners make informed decisions. This data can include customer preferences, sales trends, and operational efficiency, allowing owners to make adjustments to improve their business.

A Heko spokesperson said: "AI-powered cooking systems and technology are revolutionising the food industry by streamlining operations, enhancing food safety, and providing personalised experiences for customers.

"As this technology continues to advance, we can expect to see even more innovation and improvements in the culinary world. With the help of AI, restaurants can provide exceptional service, increase efficiency, and stay ahead of the competition in this ever-evolving industry."

In fact, AI will not only be powering cooking systems and their design but it could well be making our coffee too.

It was recently reported in The Times that a four-bean blend created by artificial intelligence had been praised by judges at the Helsinki Coffee Festival.

The Kaffa roastery employed Elev, a local AI consultancy, to train software on the flavour profiles of coffee beans in the hope it might create 'something unorthodox but drinkable'.

The AI selected four beans including Fazenda Pinhal

from Brazil as well as smaller doses of varieties from Colombia, Ethiopia and Guatemala.

Svante Hampf, the roastery's founder, said: "This was the first step in seeing how AI could help us in the future; I think AI has plenty to offer us in the long run. We are particularly impressed (with) the coffee taste descriptions it created."

And AI is also behind some of the ways caterers are delivering their food. For example, contract caterer Elior has introduced a new autonomous robot to deliver food to students' rooms at the University of Roehampton, London.

After picking up on the fact many students preferred the ease and convenience of ordering takeaways directly to their halls of residence, Elior introduced a delivery robot.

It is fully autonomous, meaning it can deliver to students without human interference and travel across all terrains, including roads. The built-in AI technology allows it to learn the best routes across campus and store that information for the next delivery, guaranteeing a quick delivery time.

Craig Stewart, divisional manager director from Elior, said: "We are excited to be introducing new technologies to our partnership with the University of Roehampton with autonomous robotics for deliveries.

"The new robot can deliver both food and retail items to students and academic staff across the large campus, with great levels of success. We look forward to further developing this use of new

technology across the campus and continuing to support students and staff with healthy, fulfilling meals."

And finally, not only the coffee, but the people who make and serve it, will find their roles changing as a result of AI.

Rastislav Rasty Kasár, the brand ambassador for espresso machine manufacturer Faema and the 2023 World Coffee In Good Spirits Champion, was asked how artificial intelligence could be the 'next big evolution' for customer-facing jobs. He identified four likely changes:

- **Evolving role of baristas:**

AI innovations allow baristas to focus on other aspects of the role like customer service.

- **Customer experience & operational efficiency:**

Technology can help alleviate challenges such as stress factors which inhibit baristas performance.

- **Technology meets human interaction:**

People won't be replaced as they are able to create personal connections with customers that robots are not yet capable of replicating.

- **The future of AI in coffee shops:**

AI presents an opportunity for baristas to evolve by integrating new technology into their craft.





SECTION THREE

HUB OF TECHNOLOGY

We asked a select group of catering equipment suppliers, consultants and design specialists how they imagine the commercial kitchen in the year 2034. This is what they said ...

Rational

Graham Kille, director of product management at Rational UK, explains: "Catering equipment could see significant integration of automation and robotics, leading to more efficient food preparation, cooking, and serving processes. Smart technology will likely become more prevalent in catering equipment.

"Artificial intelligence algorithms may be able to optimise recipes, portion sizes, and ingredient sourcing based on data analytics and customer feedback. Catering equipment is likely to evolve to be more environmentally-friendly, with a focus on energy efficiency, waste reduction, and sustainable sourcing of materials.

"Rational continues to revolutionise the culinary landscape, setting the standard for efficiency, reliability, and quality in commercial kitchens worldwide and future proofing commercial kitchens. "In short, the kitchen of 2034 will be a hub of technology, focused on making cooking easier, more efficient, and more environmentally friendly. Rational cooking systems, with the emphasis on precision and reducing waste, are well-positioned to thrive in this environment."

Will Crighton, CFSP

Will, who is national account manager at Liebherr Appliances, says: "My personal opinion is that the future will bring a lot more automation in certain areas. Anything that is a heavily repeated exercise,

such as QSR's where they are constantly building the same Big Mac or Domino's pepperoni passion, is likely to see some kind of robotic replacement once that technology becomes more readily available and financially viable.

"I expect the trend of larger options in the allergen and restricted diet foods to continue with a greater portion of the menu being health or calorie conscious. Along with sourcing of the ingredients being under more scrutiny and probably even less meat-based dishes than we currently see.

"Sustainability and energy efficiency will be key decision-making factors when buying equipment, not just the running costs but also where the materials are sourced from, how far they need to be shipped, what happens when the equipment breaks down, and where it goes once it's been scrapped."

BGL Rieber

Jon Walker, joint managing director of BGL Rieber, comments: "We are talking digital cloud and Rieber is using it to build a digital system that takes care of all aspects of foodservice including HACCP, whether you are cooking, storing, defrosting, serving and transporting food.

"The innovation is that GN containers never get lost because they are tracked - noting location, temperature etc - using digital QR codes as they move through the kitchen from prep to storage, to cooking, serving and finally, the dishwasher, and start again. One container and multiple stages of use

means big savings in energy, water and chemicals. "The QR codes can also be used to provide reheating or cooking instructions to equipment, such as our Rieber K-Pot, a GN configured digitally controlled flat cooking and heating surface which is already gaining popularity for its applicability across foodservice, including providing staff meals at any time of day, without needing any catering staff on hand."

ABDA Design

Kate Nuttall, senior catering designer at ABDA Design, thinks: "We'll be seeing more robotics within commercial kitchens to speed up production and create precise cooking results. I expect with robotic assistance that we may even see integration of artificial intelligence within equipment software. "We will also see a rise in the use of re-usable plastic containers in lieu of the paper and cardboard packaging that we are used to seeing. This is already common practice in France and is likely to come across to the UK.

"Dishwasher technology will need to adjust to allow for effective bulk cleaning of recyclable plastic containers within their accessories offerings and wash cycles. We'll also continue to see smaller kitchen footprints and therefore more multi-functional equipment within a confined space. As catering designers we'll need to be as creative as possible to help chefs get the best use of their space."

Lolly

Peter Moore, chief executive at hospitality software company Lolly, which introduced its robot waiters to the UK in 2022, adds: "Catering has evolved

massively over the last decade. Every type of hospitality provider is continually seeking to improve upon and maintain customer satisfaction levels, both in terms of the speed of service as well as looking to provide a more personalised offering."

The key changes he identifies include:

- **Technology to help place focus on dietary and allergen requirements:** Carefully designed menus using technology to handle large and complex data sets can be quickly accessed for the customer to view and order.
- **AI will continue to dominate the headlines:** More forward-thinking providers will continue to embrace AI and ML (machine learning), in order to create greater levels of personalisation and to improve the customer experience.
- **Achieving sustainability goals:** Caterers are increasingly seeking to become more sustainable and reduce their CO2 emissions by reducing waste or going paperless.
- **Effective kitchen management:** Video screens replace paper orders and help to reduce waiting times.
- **Data management:** Having access to more powerful computing means that highly complex data sets can be processed and inform the business owners, ensuring a greater personalisation of the customer experience.



SECTIONFOUR

CUTTING EDGE IDEAS THAT ARE ALREADY HERE

The public sector catering industry already has examples of advanced technology that is being used or trialled. Here are just a few ...

Drones

Argyll and Bute Council teamed up with leading drone specialists Skyports to trial the use of Unmanned Aerial Vehicles (UAVs) in delivering school meals to pupils in remote areas. The provision of school meals to remote island schools currently relies on vans, taxis and ferries, and the service can easily be impacted by adverse weather conditions.

Robots

The University of Sussex introduced a delivery robot that has 20 different expressions and brings customers' food straight to their table at its Eat Central location. The new and innovative technology uses a laser-mapping system and 3D camera to detect objects, making its journey from the kitchen to the table smooth and efficient.

Frictionless store

The Princess Royal Hospital in Telford recently joined forces with One Retail to open the first frictionless store in a healthcare setting. Once a guest completes their shopping experience, they can leave the store without waiting in line to pay. They're charged automatically on their payment card for any items taken and receipts can be requested as required.

Mixed reality

Elior UK has rolled out brand-new mixed reality (MR) headsets to enhance training for its teams serving texture-modified foods in healthcare and the retirement living sectors. Multiple people can connect to a training session while still being able to interact with one another. Elior is planning to roll out HoloLens 2 across all six catering brands during 2024.

Self-ordering

Levy UK + Ireland, in collaboration with Rangers FC in Scotland, has introduced new self-ordering technology at Ibrox Stadium. The technology is speeding up matchday service times, with fans at the Glasgow ground being able to order food and drink using the 16 interactive screens. They then pay using contactless technology.



The first NHS frictionless store won the 2024 Public Sector Catering Innovation Award

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