Cut+Dry

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The AI-Driven Evolution of Foodservice

IFDA
international foodservice
distributors association

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The **AI-Driven Evolution** of Foodservice

Abstract: Artificial Intelligence is a powerful technology reshaping global industries, enhancing efficiency, accuracy, and performance. AI is now part of our daily lives, from personalized shopping and facial recognition to virtual assistants like Alexa. Recent AI advancements, such as large language models, have democratized AI, making it accessible and affordable; you no longer need deep machine knowledge, technical expertise, and high computing power to build AI applications tailored to your needs. In the foodservice industry, AI and automation are already making an impact through robotic food delivery, food prep, and order processing. Now, generative AI holds the potential to transform sales, marketing, supply chain management, reduce food waste, optimize distribution, and automate labor-intensive processes in the foodservice industry. As AI continues to evolve and shape industries worldwide, this white paper offers an overview of the opportunities and challenges that stakeholders in the foodservice distribution industry must consider as they navigate this transformative landscape.

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A collaboration between IFDA and Cut+Dry

An IFDA Allied Member

This resource is intended to help foodservice distributors learn more about potential AI use cases for their businesses.

Cut+Dry

About Cut+Dry

Cut+Dry is an all-in-one e-commerce platform for independent foodservice distributors. They help distributors drive revenue growth, get paid faster, save time, and improve customer satisfaction. Cut+Dry launched the first AI tool in Foodservice to help distributors prospect hundreds of new customers in minutes, maximize margins, and increase case volume.

For more information, visit
www.cutanddry.com

IFDA
international foodservice
distributors association

About International Foodservice Distributors Association (IFDA)

The International Foodservice Distributors Association (IFDA) is the premier trade organization representing the $382 billion foodservice distribution industry. This industry ensures a safe and efficient supply of food and products to more than one million restaurants and foodservice outlets in the U.S. daily.

For more information, visit
www.ifdaonline.org

Introduction

Science fiction first introduced the concept of artificially intelligent robots in the early 20th century. However, it wasn't until the 1950s that scientists, such as Alan Turing, began seriously investigating the potential of artificial intelligence (AI) seriously. Initially, progress in AI was hampered by limitations in computer technology. Computers of that era were vastly expensive to operate and couldn't store and 'remember' commands, making it impossible to teach them patterns [1].

In 1956, a significant turning point occurred with the Dartmouth Summer Research Project on Artificial Intelligence, which assembled numerous top researchers. In fact, this event kickstarted two decades of AI research. Between 1957 and 1974, AI experienced notable progress, with machines becoming faster and more cost-effective. However, the limited computational power at the time caused a slowdown in AI research for a decade.

In the 1980s, AI experienced a resurgence, thanks to the introduction of "deep learning," enabling computers to learn from experience and expert systems that mimicked human decision-making processes. In the 1990s and 2000s, major milestones were reached in AI: 'Deep Blue', a chess-playing machine, defeated a world champion, and there were also advances in speech and emotional recognition in machines. It was during this time that Moore's Law, which foresaw exponential computer capability growth, became a reality. Computers not only met but exceeded the demands of AI research.

AI applications have been a part of our lives for many years, even decades. However, initially, only experts with substantial financial resources could develop and use AI technology. Today, companies like OpenAI have made AI models available for training with cost-effective pay-as-you-use structures. This has made AI affordable and accessible to a broader audience, allowing users to customize and apply base models according to their specific needs.

What does all this mean for foodservice? The future of AI in the foodservice industry involves the expansion of AI language applications and the pursuit of general intelligence. AI holds the potential to revolutionize various aspects of the foodservice sector, from improving customer experiences to streamlining kitchen operations. Picture a restaurant where AI-driven chatbots manage reservations, offer personalized menu suggestions based on dietary preferences, and even handle customer orders.

In the kitchen, AI-powered systems can aid chefs and kitchen staff in a multitude of tasks. Smart appliances equipped with computer vision can oversee the cooking process, guaranteeing dishes are prepared flawlessly. AI also enhances inventory management by forecasting ingredient usage and automatically reordering supplies when necessary, reducing waste and costs. Furthermore, the potential of driverless trucks can revolutionize delivery and warehouse management.

AI can also enhance food safety by continuously monitoring and maintaining ideal storage conditions, promptly alerting staff to potential issues. In the era of contactless dining, AI-driven robots can serve as dependable and hygienic food delivery agents within restaurants. Looking ahead, the integration of AI in the foodservice industry offers a future where distributors can optimize their operations. This white paper centers on the applications of generative AI in the foodservice industry.

Personal relationships are everything in foodservice, and AI will not replace them. However, this white paper outlines what you should understand about AI and how to leverage its capabilities to increase efficiency and grow your business.

What is AI?

In simple terms, AI is a way to teach computers to think and learn, enabling them to assist us in solving problems, making decisions, or performing tasks that typically require human intelligence. There are different types of AI, such as Natural Language Processing for understanding language, Computer Vision for recognizing objects in images, and AI for playing games like chess. However, they all operate based on the same fundamental principles.

Data Input

AI systems start by collecting and processing a lot of data. This data can be anything from text and images to numbers and sounds. Think of it as the information AI uses to learn.

Learning Algorithms

AI uses special computer programs called algorithms. These algorithms are like recipes that tell the computer how to make sense of the data. They look for patterns, relationships, and trends in the data.

Training

AI needs to be trained. This is where it learns from the data. For example, if you want to teach an AI to recognize cats in pictures, you'd feed it lots of cat pictures and tell it, "These are cats".

Feedback and Improvement

AI can also get better over time. If it makes a mistake (like thinking a dog is a cat), you can correct it, and it will learn from that mistake. This process of feedback helps AI improve its accuracy.

Make Predictions and Decisions

Once the AI has learned from the data, it can make predictions or decisions. For our cat example, it can look at a new picture and say, "This is a cat" or "This is not a cat".

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There are three primary types of AI, and the majority of AI currently in use falls under the category of Narrow AI, designed for specific task-specific applications.

1 **Narrow or Weak AI (Artificial Narrow Intelligence - ANI):**

Think of this AI as having a particular job or skill, like a robot that vacuums your floor or a chatbot for customer service. Narrow AI excels at its designated task but lacks a broader understanding of the world, as it's solely focused on its specific job.

2 **General AI (Artificial General Intelligence - AGI):**

General AI is like the robots you see in science fiction movies, such as C-3PO from Star Wars or Data from Star Trek. It has human-like intelligence and can understand, learn, and perform tasks across a wide range of activities, just like a human. It can switch from playing chess to cooking a meal or translating languages.

3 **Artificial Superintelligence (ASI):**

This is a hypothetical type of AI that's even smarter than the smartest human beings. It would be like a super-genius who can solve incredibly complex problems and make decisions we can't even fathom. Superintelligent AI is a concept that's still in the realm of science fiction, and there are debates about whether it's even possible to create it.

Generative AI

Generative AI is a category of AI systems created to produce new content like text, images, audio, or other data, resembling human-created output. It taps into learned patterns from extensive training datasets to generate creative and original content.

The mechanics? Generative AI employs deep learning techniques like generative adversarial networks (GANs) and recurrent neural networks (RNNs). Models such as GPT-3 can craft contextually fitting text based on input, finding applications in content creation, chatbots, and beyond. It extends to generating images, videos, music, and audio.

While Generative AI has evolved significantly, enabling diverse applications, concerns about ethical use, particularly in deepfakes and potential misuse, pose challenges to societal well-being.

But, why is AI so beneficial to us?

AI can perform tasks at a speed and scale that is impossible for humans. This can lead to increased efficiency in processes, reducing the time and resources required to complete tasks. AI systems are capable of high levels of precision and accuracy, effectively reducing errors in tasks demanding meticulous attention, such as data analysis and repetitive work.

AI automates repetitive and tedious tasks, allowing human workers to dedicate their time to creative and complex job elements. This shift can enhance job satisfaction and productivity. AI operates 24/7 without breaks, ensuring continuous availability. Through task automation, error reduction, and process optimization, AI can deliver substantial cost savings for businesses.

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The importance of structured data in training AI models

A previous Cut+Dry white paper discussed data, specifically structured data, covering topics such as data organization, security, and leveraging data for profit.

As a crucial link, it's important to note that all AI systems depend on data to make predictions and decisions. However, for AI models to be trained effectively and make them capable of recognizing patterns and relationships, the data must be structured.

What is structured data? "Structured" data is information neatly organized into tables, databases, and spreadsheets with rows and columns. It's accurate, consistent, and reliable, serving as a foundation for training AI systems.

Data policy

When using business data in an AI context, it is important to have robust data policies in place that allow data to be used responsibly. Firstly, businesses must ensure data privacy and security by implementing measures to safeguard sensitive information, comply with regulatory requirements and insulate from potential data breaches. Validation processes must be implemented to ensure high levels of data accuracy and reliability, with constant monitoring and maintenance.

There are also ethical considerations when using data that must be accounted for, with strong regard for data transparency and fairness in how data is collected, processed and used, and how it's applied to train AI models. Businesses also need to invest sufficiently in the necessary infrastructure, technology and human resources to handle and analyze the data that is collected. You can find out more about protecting your data in **Cut+Dry's previous white paper.**

It's essential to note that not all AI relies on structured data; some AI systems work with unstructured data, such as text, images, videos, and semi-structured data formats. However, in foodservice, the data must be structured. Here are a few examples of how structured data can benefit AI applications.

Type of structured data	What AI can do with it
Customer order data which includes historical order information, seasonal variations, and market trends	AI can analyze this data to forecast demand accurately. It can predict when specific products will be in higher demand, helping the distributor stock the right quantities and minimize overstock or understock situations.
Inventory data, including product quantities, expiration dates, and supplier information	AI can optimize inventory management by continuously monitoring inventory levels and suggesting when to reorder products. It can also help prioritize which items to restock based on demand forecasts.
Data on customer locations, delivery time windows, and traffic conditions	AI can optimize delivery routes, ensuring that products are delivered efficiently and on time. This not only saves on fuel costs but also improves customer satisfaction by reducing delivery delays.
Supplier performance data, pricing, and lead times	AI can analyze this data to identify the most reliable and cost-effective suppliers. It can also help negotiate contracts and optimize the procurement process to ensure a steady supply of quality products.
Data on quality controls, inspections, and product quality reports	AI can help identify quality issues early by flagging anomalies in the data. For instance, it can detect patterns of product defects or deviations from quality standards.
Customer preference data, ordering patterns, and product preferences	AI can segment customers based on their specific needs and preferences. This can help the distributor tailor its product offerings and marketing strategies to different customer groups, enhancing customer satisfaction and loyalty.

Applications of AI for Foodservice Distributors

AI has the potential to revolutionize sales, marketing, supply chain management, optimize distribution, and automate labor-intensive processes in the foodservice industry. We'll explore how AI benefits **(1)** sales and marketing and **(2)** transportation and supply chain management.

In this section, we'll explore two types of AI: Natural Language Processing (NLP), enabling computers to understand and respond to human language (e.g., chatbots like ChatGPT), and Generative AI, which generates new content such as writing stories or creating pictures, akin to human creativity.

Applications of Generative AI in Sales and Marketing

Generative AI, like GANs or language models, can bring creativity to sales and marketing for foodservice distributors. Think of it as a super assistant that helps create engaging content, like catchy ads or enticing product descriptions, similar to how humans come up with creative ideas. Here are some potential applications:

1   **Dynamic pricing strategies:** AI algorithms can utilize generative models to dynamically adjust pricing strategies to analyze market trends, competitor pricing, and customer behavior. This ensures competitive pricing and maximizes revenue.

2   **Suggestive Selling:** Generative AI can analyze customer data to dynamically update and push product suggestions, enhancing suggestive selling strategies and improving customer engagement. For example, "Top Category Picks" or "Frequently Purchased With" modules inside a foodservice distributor's digital catalog.

3   **Personalized marketing campaigns:** Generative models can analyze customer data to generate personalized promotions and marketing campaigns. This customization of offers based on individual preferences can significantly enhance customer engagement and loyalty.

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4 **Content generation:** Generative AI can be utilized to produce engaging and personalized marketing content, encompassing product descriptions, social media posts, and blog articles. This can streamline processes, save time and resources, all while maintaining a consistent brand voice.

5 **Identifying Underperforming SKUs:** Utilize Generative AI to analyze sales data and customer preferences, helping identify underperforming Stock Keeping Units (SKUs). The system can suggest targeted promotions, marketing campaigns, or recommend discontinuing certain products. This proactive approach ensures efficient inventory management and maximizes sales potential.

6 **Visual content creation:** GANs can produce lifelike images of food items, facilitating the development of visually appealing marketing materials like catalog images, advertisements, and social media visuals. This is especially beneficial for products lacking professional photos.

7 **Recipe generation:** AI can be employed to craft new and innovative recipes tailored to customer preferences, dietary restrictions, or current food trends to help sell new or existing products. These recipes can then be seamlessly integrated into marketing materials, showcasing the foodservice distributor's versatility and creativity in their offerings.

8 **Chatbots for customer engagement:** Integrating generative language models into chatbots can enhance customer interactions by providing more natural and contextually relevant responses. This can be particularly valuable in handling customer queries, order processing, and providing product recommendations.

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Applications of Natural Language Processing for Sales and Marketing

Natural Language Processing (NLP) AI can significantly benefit foodservice distributors in sales and marketing. Imagine a ChatGPT dedicated to foodservice – a super assistant that understands every aspect of your business and provides data-driven answers to everything. Here are some specific applications:

1 **Demand forecasting:** NLP algorithms can analyze text data, such as customer feedback, reviews, and industry reports, to provide insights into emerging trends and demand patterns. This information can inform inventory management and marketing strategies.

2 **Email marketing personalization:** NLP can analyze customer data and preferences to personalize email marketing campaigns. By understanding customer behavior and language patterns, foodservice distributors can tailor their messages for higher engagement.

3 **Competitive analysis:** NLP tools can process and analyze textual data from competitors' websites, reviews, and marketing materials. This information helps foodservice distributors stay informed about market trends, pricing strategies, and customer perceptions.

4 **Voice search optimization:** With the increasing use of voice-activated devices (e.g. Siri), NLP helps optimize catalog content and product discovery for voice search queries. This is crucial for ensuring that foodservice distributors' products are easily discoverable through voice-activated assistants.

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Applications of AI in Transportation and Supply Chain Management

Foodservice distributors can leverage AI applications in transport and supply chain management to enhance efficiency, cut costs, and improve overall operations. Here are eight specific applications:

1   **Route optimization:** AI algorithms analyze real-time traffic data, historical delivery patterns, and other factors to optimize delivery routes. This ensures timely and cost-effective transportation of goods, reducing fuel consumption and improving overall efficiency.

2   **Inventory management:** AI assists in demand forecasting, allowing foodservice distributors to optimize inventory levels. By analyzing historical sales data, market trends, and other factors, AI helps prevent overstocking or stockouts, improving overall inventory efficiency.

3   **Warehouse automation:** AI-powered robotics and automation systems enhance efficiency within warehouses. Automated sorting, packing, and retrieval processes contribute to faster order fulfillment, reducing manual labor and minimizing errors.

4   **Supply chain visibility:** AI provides real-time tracking and visibility across the supply chain. By monitoring the movement of goods, inventory levels, and delivery status, foodservice distributors can make informed decisions, reduce delays, and enhance overall transparency.

5   **Last-mile delivery optimization:** AI is used to optimize the last-mile delivery process, considering factors such as delivery windows, traffic conditions, and customer preferences. This ensures timely and efficient delivery, enhancing customer satisfaction.

6   **Predictive maintenance:** AI-driven predictive maintenance systems monitor the health of vehicles and equipment in the supply chain. By analyzing sensor data and historical performance, AI can predict when maintenance is needed, minimizing downtime and preventing costly breakdowns.

Conclusion

AI is a transformative and foundational technology with the potential to significantly reshape many industries. Its ability to work alongside humans enhances efficiency, increases problem-solving, automates repetitive tasks, and frees up human labor for more creative endeavors. The capacity to generate original content and process vast amounts of data quickly opens up new possibilities.

AI's capability to process vast amounts of data rapidly enables it to offer valuable insights and predictions, resulting in improved and quicker decision-making. This has been particularly evident in the healthcare industry, where AI aids in expediting diagnoses, leading to enhanced patient outcomes. AI excels in addressing complex problems that may be too time-consuming or challenging for humans to handle effectively. Additionally, AI's ability to adapt and learn from new data and experiences contributes to its increasing capability and responsiveness over time.

AI, much like many technologies, isn't a one-size-fits-all solution; it needs to be trained for specific purposes. This process has become more accessible and affordable with AI models that can be trained to meet specific needs. However, successful training relies on well-structured data, organized in a way that aids AI in understanding and learning from it. Structured data serves as the foundation for AI, making it crucial to get it right as an initial and essential step (refer to our previous white paper for more insights on structuring data).

In the foodservice industry, embracing AI applications like generative AI can bring substantial improvements, including enhanced sales and marketing, improved customer experiences, efficient operations, better decision-making, and reduced waste. Thoughtful and responsible adoption of AI technologies can provide foodservice distributors with a competitive edge in a dynamic and evolving industry.

Spotlight on 'Yes, Chef!' the World's First AI Tool for the Foodservice Industry

We avoid featuring Cut+Dry products in these documents since they are meant to be informative and unbiased. However, we'll delve into 'Yes, Chef!'—the world's first AI tool for the foodservice industry—in this section. We're not aware of many other noteworthy AI examples dedicated to foodservice that we can use for comparison. 'Yes, Chef' is an AI tool built by training machines to structure foodservice data.

The first version of "Yes, Chef" is crafted to address top-of-the-funnel and customer support challenges faced by foodservice distributors. It equips sales reps with essential tools for enhanced marketing to restaurant operators and includes features to boost sales and customer acquisition. "Yes, Chef" includes:

1. Digital prospecting and proposal tools to increase distributors' book of business - turning any sales rep into a superhuman. "Yes, Chef!" allows them to identify hundreds of potential customers swiftly and generate highly targeted proposals with competitive pricing to maximize sales volume.

2. Data-driven AI product recommendations to sell more. "Yes, Chef" analyzes purchasing patterns from thousands of similar restaurants, automatically suggesting new products within the distributor catalog and order guide.

3. In-depth insights into customer behavior, order trends, and product catalogs. Think of "Yes, Chef!" as your personal super assistant, capable of accurately answering any questions you may have about any aspect of your business.

4. Tools to identify underperforming SKUs, providing actionable insights to manage inventory and boost sales. These marketing solutions will help distributors sell excess products, create promotions, and market products effectively.

These are just a few examples of the "Yes Chef!" AI. More is on the way; Cut+Dry is just getting started.

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