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Role And Importance Of Artificial Intelligence In Food Sector: Past, Present And Future

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ABSTRACT

Artificial intelligence's potential function is coming into focus more and more. Manufacturers are searching for cutting-edge manufacturing procedures to keep up with this rapid expansion, and the emergence of AI is one such example. AI is more usable since it offers some level of interaction between system users and the system itself. The right to make decisions is one of the fundamental human rights. The researcher have been getting by own brains up until now. The researcher can object if a human remedy is imposed on respondent, but researchere will have to accept "absolute" artificial intelligence. Should researcher use this? Researcher attempted to concentrate on the benefits and drawbacks of applying AI to the food business in researcher study article. There are helpful suggestions for how the sector may utilise SWOT analysis to assess the viability of AI deployment in the food sector and whether it is good for their particular industrial requirements. The purpose of this research is to decide whether AI should be implemented or used to enhance the food industry.

KEYWORDS: AI, Food Industry, SWOT Analysis

Introduction

Researcher utilise a variety of household items, RTV, and appliances that are made and put together from in the automated line production's subassemblies process, which heavily relies on robots. . In public parks, robots are in charge of directing people's actions

in accordance with anti-pandemic safety guidelines and equipment. In the US and the UK, more than 75% of millennials want to employ AI technology to get greater help with meal planning and preparation. By 2050, it is anticipated that there will be roughly 9 million people on the planet. The agricultural industry would have to boost its production by roughly 70% to feed this enormous population. Due to technology the central component of the food sector if this goal is to be accomplished. In the future, artificial intelligence will be crucial to food production. The food and beverage industries are advancing quickly in their use of technology for operational and logistical efficiencies, as well as finding ways to satisfy customer demands. Artificial intelligence has been adopted by the major players in the market to retain great empathy with their audience .

AI's importance and role in the food industry

By automating manual processes, the use of AI systems increases employee productivity and gives workers more time to think strategically. The application of AI found in food business reduces Consumer resistance at the checkout counter .

Accelerating manual labour

AI programme implementation enables the automation of manual operations so that they are no longer need to be completed independently. This frees up more time for strategic duties and increases staff productivity. The use of AI in the food business has reduced customer friction at the point of sale.

lowering the employee-overtime ratio

Implementing AI for all daily tasks will reduce the percentage of employees who work overtime**.**

Running processes and issues with observance

Food and beverage businesses are subject to numerous procedural rules, and one can programme rules into an AI system to detect and eliminate inefficiencies by evaluating data and looking for methods to improve.

Organizing Food

AI is being used by businesses in the food sector to create devices that vastly enhance food sorting. These sensor-based technology systems make use of cameras and sensors to display good food for human perception. Using computer vision, an AI technology divided foods according to their quality.

Employees' Adoption of Personal Hygiene Practices

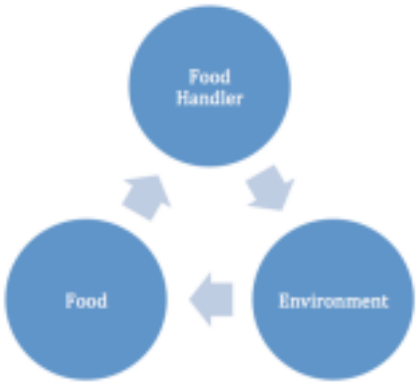

Figure 1. Food handlers' interactions with the environment and the food

Figure 1 illustrates the relationship between food handlers, the environment, and the food. AI enables businesses to swiftly identify and rectify any inefficiencies in this area for increased food safety. CCTV cameras with specialised facial recognition technology keep an eye on food service employees to see if they maintain proper cleanliness when prepping, cooking, and delivering food.

Reduction in Maintenance and repair costs

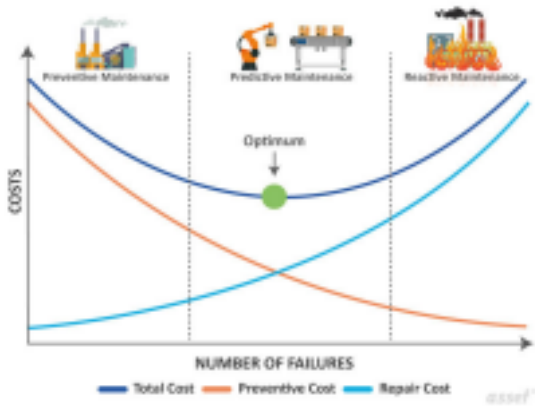

Figure 2. Costs of upkeep and repairs

AI may make it easier to transition from costly preventive maintenance to predictive maintenance.

Techniques for self-cleaning and improvement

AI's Self-optimizing-clear-place (SOCIP) approach can speed up cleaning while significantly reducing the amount of water required in the process. SOCIP employs characteristics like ultrasonic detection and optical fluorescence imaging to find even the slightest traces of food residue and microbiological detritus inside the machinery. This improves the cleaning and maintenance procedure' optimization.

AI can improve supply chain management

Figure 3. AI in the food industry

Sanitary standards have been tightened as a result of the FSMA (Food Safety Modernization Act), taking the entire supply chain into account. Spices, cereals, and other non-perishable foods need to be refrigerated are now at risk of infection, which is the cause. Such goods weren't previously prone to infection, but that has changed lately .

By closely monitoring each step of the supply chain, AI reduces delays and increases profit margins. Additionally aids businesses in accurate product stocking and pricing control through forecasting. AI is also used to trace products from the farm to customers when there are transparency problems. Technology is currently being used more and more by retailers and suppliers to cut waste and enhance inventory control. AI demonstrates to be the ideal answer in relation to enhancing the visibility and management of the food supply chain because it maximises the reduction of waste and enhances the product's freshness .

Revolutionizing the whole in-store shopping experience with new products

AI decreases delays and boosts profit margins by carefully monitoring every stage of the supply chain. Forecasting also helps firms with proper product stocking and pricing management. When there are issues with transparency, AI is also utilised to track products from the farm to the consumer. Retailers and suppliers are now utilising technology more and more to reduce waste and improve inventory management. Because it maximises waste reduction and improves product freshness, AI appears to be the best solution for improving the visibility and management of the food supply chain.

AI analysis of customer data

The food sector can utilise AI to analyse customer data and identify sentimental behaviours that are crucial for the creation and design of new items as well as for determining whether or not experiences were favourable or bad. Due to the fact that businesses can now provide an infinite variety of taste combinations, spices, and ingredients, this has proven to be a significant contribution to the food industry**.**

<u>Customised client services</u>

The food business can track consumer preferences and the items they frequently order thanks to the predictive analysis tools like chat boxes and voice assistants that are driven by natural language processing and tap consumer shopping history. Therefore, the food

sector can add customised items to the menu options for consumers with the help of this AI-featured technology**.**

Describe a new recipe

People may now save time, food, and money in the kitchen while learning new, delightful recipes and even creating their own unique, individualised flavours thanks to AI technologies like machine learning and image recognition.

Sites offering food

The accuracy and effectiveness of administrative operations including producing reports, placing orders, distributing crews, and developing new duties can be improved through automated customer service and customer segmentation .

AI for improved agricultural practises

Companies in the food industry are currently examining how AI may be adapted to the upcoming farming practises. Modern AI applications in the food industry have reduced downtime significantly, decreased customer Disputes at the register , sped up manual activities, and improved the ratio of workers to overtime .

The best method for delivering meals

Many businesses use AI-based meal delivery systems that streamline the transition from food ordering to food delivery. Robots now transport meals to doorsteps in addition to being utilised in food processing and manufacturing. With the use of AI technology, all of these are achievable.

AI's difficulties and potential solutions

AI is no different; it has advantages and disadvantages. The following drawbacks apply to this excellent technology. • In order to prevent any problems in the future, businesses must ensure that their personnel have the necessary skills to maintain this AI system updated.
• Businesses that lack these resources can look for food and beverage solution providers who have already put in place AI systems that will enhance front-end and back-end operations.

Some of these companies that were created specifically for distributors of food and beverages include SAP and Bundled Solutions.

• The cost of implementing AI is another major barrier, as food companies have relatively low profit margins and limited resources compared to Amazon and Google.

Suggestions

Strengths, Weaknesses, Opportunities, and Threats is referred to as SWOT. Applying this will help the food business make better decisions on the application of AI.

Strengths	Weaknesses
Can AI be used in the food sector to assess how well they work together? What special AI capability can you use? What distinguishes you from the competition?	What might be enhanced by AI? Where is the lack of applications for AI development? What did rivals identify as a weak point?
Opportunities	**Threats**
What possibilities are created by the application of AI to the food business. What trends might you use to your advantage? How the opportunity of AI can change the food industry's strengths.	Businesses can assess risks brought on by AI under the threats area. What are rival companies using AI for? What vulnerabilities do you expose as threats?

Conclusion

At a compound annual growth rate (CAGR) of 2.9%, the market for food and drinks worldwide is predicted to increase from $5943.8 billion in 2019 to $6111.1 billion in 2020. After that, the market is anticipated to bounce back and expand at a CAGR of 7%, reaching $7527.5 billion in 2023. (Research and Markets 2020). With all the talk about AI's importance and role in the food business, one thing is abundantly clear: the sector needs to make investments in innovation to reduce costs, boost earnings, and keep abreast of consumer trends.

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