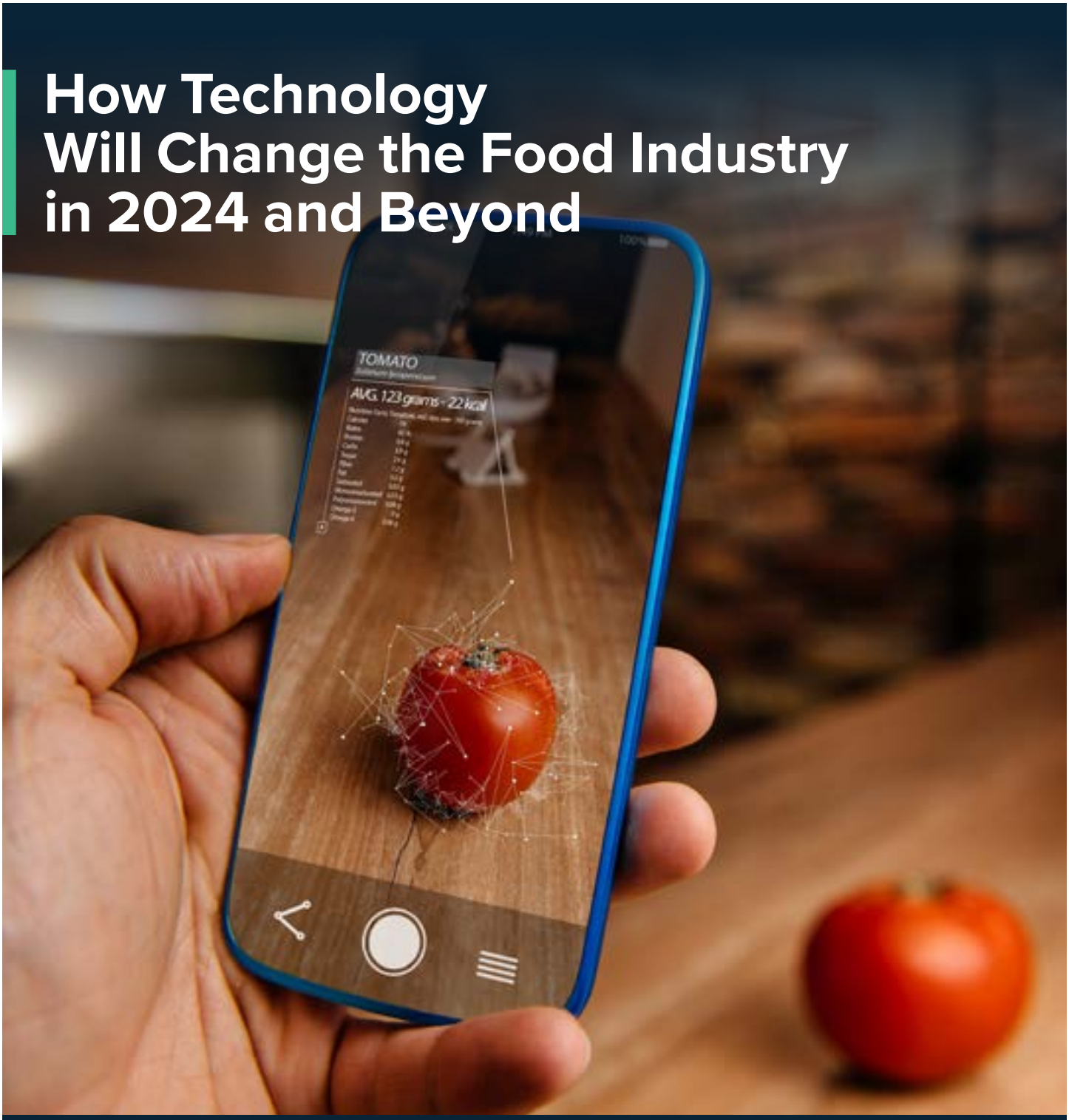
How Technology Will Change the Food Industry in 2024 and Beyond



Food production has changed more in the last 200 years than in the previous ten thousand. The effort has always been aided by science and the advancement of machines, but today, the urgency for modernization through technology has never been more important.

ZAG Technical Services

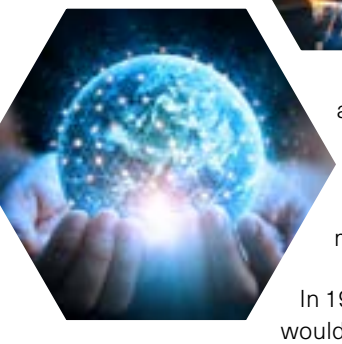
The Need for Technology

Labor shortages, consumer demands, global competition and the economics of a post-pandemic world accelerated the need for business to create competitive advantages wherever they can be found. The digital world has many of the answers.

A History of Preparation

The Industrial Revolution from 1760 to roughly 1840 converted human labor into machine labor and set a path for economic growth due to the mechanization of labor. Into the 20th Century, steamboats and railroads provided market accessibility and Ford's 1913 assembly line ushered in a new standard that popularized mass production. Even WWI and WWII created advancements in manufacturing, transportation, and financial systems, including growing use of assembly line manufacturing methods to keep up with wartime equipment needs such as artillery and the new B-29 bombers.

By the 1950s, computer aided design (CAD), robotics, and advanced circuitry were advancing automation in every business sector and were only the beginning of what would lead to the peak of U.S. manufacturing in 1979 and launch the digital era. In 1981 IBM launched the first PC and the personal computer was born. It would signal the biggest change in front office management and systems integration.



In 1989 the world met the internet, which would expand to include the world wide web, and by the mid 2000s it would become a mainstream tool. Today, our increasingly digital world delivered social media, smart phones, and the Internet of Things (IoT), forever changing how we do business.

2024 & Beyond

Technology will be the turning point, intersecting connected devices and a new digital age of quantum computing.

Although it's difficult to predict the future, we do know that the food and beverage industry is already embracing exciting new technology that will transform the industry in 2024 and beyond.

Big Data is Big Business

Data is becoming one of the most important assets driving business growth, from delivering amazing customer experiences to emerging ESG standards. Sustainability benchmarking alone, including tracking food waste, is now a key priority.

Improved technology and integrated systems are capturing huge quantities of data that needs to be analyzed. Everyone from engineers, scientists, buyers, and marketers are using data to monitor inputs, assess operations, improve efficiency, reduce costs, ensure better quality control, meet consumers' needs, optimize resources, reduce waste, and enhance the overall consumer experience.

Artificial Intelligence: The New Business Brain

AI and machine learning have revolutionized food processing, food & beverage, and agriculture over the past 30 years. Initially limited to sorting, AI now improves accuracy and efficiency, while recommendation systems boost sales. Expect to see predictive analytics for consumer trends, AI-driven robotics, and enhanced food safety outcomes. The convergence of AI, ML, and IoT will enhance traceability and transparency. These technologies drive efficiency, sustainability, and safety.

To capitalize on AI trends in food industries, executives should prioritize effective data collection and management, ensuring data quality for AI insights. They must also understand and adhere to industry regulations regarding AI to ensure responsible use. Fostering a culture of change and innovation within the organization will facilitate smooth AI integration. Additionally, executives should identify and mitigate risks associated with AI, such as data breaches and biases, through well-defined strategies.

There is a lot of buzz about AI and we believe it is warranted.

The level of detail that **AI** can provide **exceeds** what the human mind can compute. It discovers patterns and removes the "judgment call."

Expansion of the Internet of Things (IoT)

The IoT is devices such as smartphones, sensors, and machines that have the ability to collect and process data, then connect and exchange that data with other devices over a network or the internet. The name is sometimes criticized because IoT devices

do not necessarily have to be connected to the internet, but simply to a network of other IoTs.

$8.43 Billion

Big data is being driven by the IoT and in the food and beverage industry is projected to reach $8.43 billion by 2025[1].

With the vast number of applications being developed and the ability for real-time reporting, every aspect of the food industry can be impacted and potentially improved. Throughout the supply chain, growers, processors, shippers, manufacturers, and retailers are finding ways to achieve operational and financial efficiencies using IoT. These wins are being achieved in food safety, logistics, supply chain management, waste reduction, sustainability and more.

Automation Amplifies People

It's no secret that there is a labor shortage. Every industry is feeling the pinch, particularly food and beverage. The mid-1960s ushered in the robotic era of manufacturing, but the food industry had been slow to adopt the time saving technology. Today in a post-pandemic era that saw changes in every aspect of the food industry from farm to fork, the industry is rapidly embracing robotics and automation to empower their workforce while also reducing labor expenses.

$8.5 Billion
Precision Agriculture

$2 Billion
Food Processing Robotics

A Markets & Markets report already puts the precision agriculture market at $8.5 billion[2] and robotics for food processing is expected to break $2 billion[3] by 2028. This does not account for the use of robotics in foodservice for repetitive prep and cooking.

With fewer limits on access to labor and hours worked, robots can perform tasks with rapidity and accuracy, and they're able to capture data as they operate.

Automate to Mature

Just as AI is a tool used to better understand the world in which we operate, Robotic Process Automation (RPA) automates business process through workflow replication.

With more data and more IoT devices comes more opportunity for business insights. RPA helps automate many operational administrative tasks, freeing up employees to deliver more strategic and valuable work.

Augmented or Virtual, It's Still Reality

Most people are familiar with Virtual Reality; a simulation of an alternate world. Alternately, Augmented Reality (AR) projects an enhanced reality through the lens of the users camera, essentially building upon the reality seen through human eyes. Some may have seen a former AR campaign launched by Patron[4] that took users through the process of making their tequila in small batches from the perspective of a bee. And who can forget Millennials with their heads buried in their phones exploring our beautified towns and cities through Pokemon Go[5]? While there are an infinite number of similar ways to market and promote a company, product or brand, AR can and will be used in many operational functions in the food industry in the near future. Expect to see AR solutions for job training, product development, emergency response, and transformative dining experiences.

The Blockchain Bolster?

With more data and online connectivity comes a need for more security and privacy. Blockchain is a tool that records and distributes digital information but does not allow it to be edited—including attempts to delete or destroy it—by any user. This helps reduce the risk of fraud by providing unaltered transaction traceability. Blockchain is especially helpful in food safety programming and is being utilized by many major food companies today. We can expect to see the use of blockchain grow, enhancing data security and supply chain visibility.

It's clear that technology is a given of the modern workflow continuing to transform and influence businesses, react to trends, drive economies, and even impact social well-being.

As a tool, technology has helped businesses across the globe grow rapidly. But with it comes a new set of challenges and limitations that must be addressed, including new and potentially crippling risks related to security and privacy.

Gone are the days of a single IT desk supporting the basic needs of connectivity related to phones and computers. The sheer number of applications that businesses rely on and the complexity of today's systems and technologies, coupled with the highly confidential nature of the information they secure, requires employee upskilling and highly skilled tech professionals.

Proactive businesses should be looking to a broad team of IT specialists and managed service providers to implement and manage a new set of protections and tools not previously needed.

While the food business continues to advance and innovate using technology, the industry as a whole is still far behind others. Now is the time to assess your strategic needs and hire technology professionals ready to build safer, more reliable, and resilient business systems that will help you grow your business.

ABOUT ZAG TECHNICAL SERVICES

ZAG Technical Services is a tech company with roots in agriculture and a specialty in agribusiness. We understand perishability, speed to market, labor issues, implementation of ag tech and the challenges of your business so we can bring you IT and managed service solutions to outsmart, outpace and outperform the competition.

Have questions?

Contact us at 408.383.2000 or email us at info@zagtech.com

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