Chapter 12
Next-Gen Eats:
Tech, Trends, and Sustainability

Muhammad Afnan Mahusain
https://orcid.org/0009-0002-5991-7027
Taylor's University, Malaysia

Azlina Samsudin
Universiti Teknologi MARA, Dungun, Malaysia

Mohd Aliff Abdul Majid
https://orcid.org/0000-0002-3832-5770
Universiti Teknologi MARA, Puncak Alam, Malaysia

ABSTRACT

This chapter explores the significant transformations within the food service industry, driven by the integration of advanced technologies and a focus on sustainability. As the industry evolves, stakeholders must adapt to these changes to remain competitive and resilient. By embracing automation, AI, IoT, and robotics, the food service sector can enhance operational efficiency, reduce waste, and improve accuracy, aligning with Sustainable Development Goals (SDGs) such as SDG 8 (Decent Work and Economic Growth) and SDG 12 (Responsible Consumption and Production). Additionally, the adoption of sustainable practices, supported by technological innovations, addresses environmental challenges, contributing to SDG 11 (Sustainable Cities and Communities). Additionally, emerging trends like AR, VR, and drones are explored as potential game-changers in the industry. This chapter serves as a guide for stakeholders to understand and adapt to these advancements, ensuring they stay competitive and ready for future opportunities in an ever-evolving landscape.

INTRODUCTION

The food service industry is undergoing a profound transformation driven by technological advancements and a focus on sustainability. The adoption of automation, AI, IoT, and robotics is revolutionizing how food is prepared, served, and managed, leading to significant improvements in speed, accuracy, and cost-effectiveness (Chapman et al., 2021). Automation technologies streamline kitchen operations (Voipio et al., 2021), reducing labor costs (Khot et al., 2019) and minimizing human error (Tuomi &

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Ascenção, 2023), while AI and machine learning enhance predictive analytics for demand forecasting and inventory management, reducing waste and ensuring optimal resource utilization. These advancements contribute to SDG 8 (Decent Work and Economic Growth) by creating new job opportunities in tech-driven roles and improving overall productivity.

Additionally, digital transformation impacts customer experience by introducing digital ordering systems, self-service kiosks, and mobile applications, which offer convenience and personalization, enhancing customer satisfaction and loyalty (Lee & Lee, 2020). These innovations also support SDG 12 (Responsible Consumption and Production) by promoting efficient resource use and reducing waste through precise portion control and real-time data analytics. Furthermore, the integration of sustainable practices through technological innovation addresses critical environmental challenges. AI and IoT technologies optimize supply chain management, reducing food waste and spoilage, while energy-efficient kitchen appliances and systems lower energy consumption and operational costs (Jagtap et al., 2020).

The chapter also explores future trends and emerging technologies, such as augmented reality (AR), virtual reality (VR), and drones (Kim et al, 2018), which have the potential to further revolutionize the food service industry by enhancing dining experiences, improving staff training, and streamlining delivery logistics. As consumer behavior and expectations evolve, there is a growing demand for personalized and immersive experiences, which these technologies can fulfill. Staying ahead of technological and sustainability trends in the food service industry is essential for businesses to remain competitive and resilient. This involves not only adopting cutting-edge technologies but also investing in research and development to anticipate and respond to future challenges and opportunities. By doing so, food service businesses can better position themselves to meet the evolving demands of consumers and navigate the complexities of a rapidly changing market.

The chapter highlights the importance of building sustainable urban food systems (Moragues-Faus & Battersby, 2021), contributing to SDG 11 (Sustainable Cities and Communities) by enhancing community well-being and resilience. Implementing sustainable practices within urban food systems can include initiatives such as urban agriculture, which reduces the need for long-distance transportation and lowers carbon emissions. Additionally, by creating shorter supply chains, urban food systems can enhance food security and provide fresh, nutritious produce to urban populations. Incorporating technology, such as IoT-enabled sensors and data analytics, allows for better resource management and optimization of food production processes.

INTRODUCTION TO TECHNOLOGICAL ADVANCEMENTS IN THE FOOD SERVICE INDUSTRY

Overview of the Current State of the Food Service Industry

The food service industry is on the cusp of a technological revolution that promises to redefine operational efficiency, customer experience, and supply chain management. The industry has evolved from traditional, labor-intensive methods to incorporating sophisticated technologies that streamline operations and enhance service delivery. The fourth industrial revolution, or Industry I4.0, has been gaining momentum since 2015, being a significant driver for sustainable development and a successful catalyst to tackle critical global challenges. The most relevant food Industry I4.0 technologies including, among others, digital technologies (e.g., artificial intelligence, big data analytics, Internet of Things, and block-