Introduction

In the era of data-driven decision-making, this survey paper delves into the convergence of data science and sustainable waste management through the lenses of Winnow and Kitro, two prominent smart bin companies. Through insightful interviews and case studies, this paper examines how these companies leverage advanced data analytics, sensor technology, and machine learning algorithms as the backbone of their waste reduction strategies. By exploring the intricate ways in which data science techniques are employed to transform raw waste data into actionable insights, this research sheds light on how these companies optimize food waste reduction, operational efficiency, and environmental sustainability within the food industry. At the crossroads of technology and data-driven sustainability lies the innovation of Winnow and Kitro, exemplars in the smart bin industry. This survey paper takes an in-depth look at the integral role of data science in redefining waste management paradigms. Through interviews and comprehensive analysis, the paper examines how these companies leverage data-centric approaches, including Internet of Things (IoT) devices, cloud computing, and artificial intelligence, to revolutionize waste tracking, sorting, and mitigation. By highlighting the symbiotic relationship between data science and waste reduction, this research underscores the transformative potential of technology-driven solutions in the food sector.

In the pursuit of sustainable waste management solutions, this survey paper unravels the intricate interplay between data science and waste reduction strategies employed by Winnow and Kitro. Through a data-centric lens, the paper investigates how these companies harness data analytics, sensor networks, edge computing, and machine learning to inform data-driven decision-making in commercial kitchens. By drawing insights from interviews and empirical data, the research showcases how data science technologies enable predictive analytics, behavior analysis, and continuous improvement in food waste management practices. The paper ultimately underscores the pivotal role of data science in catalyzing innovation and efficiency in the context of smart bin solutions.

According to some statistics, about 1/3rd of the food produced is wasted before it reaches the customer’s plate. And about 14% of this waste comes from industry kitchens. Entrepreneurs from all around the world have come up with Smart Bin solutions that will help kitchens measure the food wasted and track these measurements to gain meaningful insights. These solutions combine IoT and AI with data analytics to give chefs of these kitchens the much-needed data that help them reduce food being disposed.