


# Chapter 15

## Software Engineering and IoT–Driven Systems for Monitoring Sustainable Food Practices in Hospitality

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### ABSTRACT

*Rapid urbanization has created problems and sustainability issues for cities, but smart cities (SC) have emerged as a hope. SC services can promote urban sustainability and life quality (QoL), increase public value, streamline everyday routines. In digital era when smart homes are becoming common, this study investigates the practical applications and implications of integrating IoT devices into kitchen environments for hospitality industry to reduce waste, optimize resources, and meet environmental goals. It focuses on an increase in demand for sustainable methods. This study inspects the application of SE and IoT technologies to track and improve sustainable food practices in hospitality processes. This chapter elaborates on how IoT-driven automation might improve convenience, efficiency, and sustainability in food preparation, storage, and consumption. This analyzes real-world use cases and developing trends to explore the impact of IoT-based Kitchen Automation Systems.*

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## 1. INTRODUCTION

Digitalization is viewed as a critical component for the future of hospitality services. Recent technological advancements undergoing significant change which are altering operational efficacy and client service in the hotel industry. One of the most important innovations is the combination of Internet of Things (IoT) and Software Engineering (SE) technologies, which may revolutionize the tracking and improvement of sustainable food practices. Environmental concerns are putting pressure on hotels to implement procedures that optimize food source, preparation, and consumption. Global goals, such as the United Nations Sustainable Development Goals (SDGs), particularly those relating to climate change and responsible production and consumption, are consistent with these efforts. In the hospitality sector Sustainable food practices have risen as an important part of ethical enterprise. The environmental effects, like food waste, wasteful resource use, and wasteful supply chains, realizing more and more consumers. Therefore, Sustainability is becoming a competitive advantage for the hospitality sector, and there is a greater demand than ever for technology that can assist track and improve these practices.

Yet, studies that compare these technologies in several sectors are available, but hospitality has mostly gone unexamined.

In spite of the latest technology, the hospitality industry still fights issues such as throwing away a lot of food, lacking overall inventory control, wasting resources and low transparency in food supply. Things are worsened by not being able to coordinate certain activities and because sustainability metrics are not easy to track in real time. These issues must be sorted out to increase how well companies can handle problems and remain sustainable.

Internet of Things is a network of linked devices with real-time data sharing and communication capabilities. IoT-driven solutions would be the best option for attaining sustainability in food management in this regard. In the hospitality industry, these devices are often fitted with sensors to gather data on inventory levels, storage conditions, food preparation procedures, and waste production among other areas of food management. To make better decisions possible through the accurate monitoring, analysis, and management of food-related operations by the integration of this real-time data with sophisticated software systems.

Modern digital technologies—particularly IoT—enable predictive insights that help food service providers reduce waste, manage inventory effectively, and ensure food safety. For example, by identifying patterns in food consumption and waste, these systems allow businesses to optimize procurement, minimize spoilage, and extend shelf life. Rather than broadly restating IoT advantages, the focus should be on how these capabilities address specific pain points in hospitality operations.

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