**Chapter 1**

**Introduction**

**1.1 General Problem**

Retail stores, especially those in the food sector, often face significant challenges related to inventory management, leading to inefficiencies that impact both financial performance and customer satisfaction. Among the most pressing issues are overstocking, stockouts, and waste due to expired goods. For instance, In Poland, it is estimated that approximately 5 million tons of food are wasted annually. Of this, about 60% occurs in households, while the retail sector accounts for approximately 7% of the total food waste(​[Poland Insight](https://polandinsight.com/poles-still-waste-5-million-tons-of-food-annually-despite-growing-awareness-32882/?utm_source=chatgpt.com), 2024).[[1]](#footnote-1)

In addition to food waste, the problem of overstocking and stockouts presents a serious challenge. Overstocking ties up valuable storage space and leads to financial losses as goods sit unsold, while stockouts prevent stores from fulfilling customer demand, leading to missed sales and customer dissatisfaction. The imbalance between supply and demand is further exacerbated by inaccurate forecasting, reliance on manual tracking, and delayed reordering processes. Smaller stores, in particular, often struggle to adopt effective inventory management systems due to the high costs and complexity of existing software solutions designed for larger enterprises.

This project aims to tackle these problems by developing a system that optimizes inventory management practices through automation, better stock tracking, and more accurate demand forecasting. By implementing strategies like FIFO (First In, First Out) and automating reorder processes, the system will reduce waste, avoid overstocking, and ensure that stores are always stocked with the right amount of goods. The objective is to provide small and medium-sized stores with an affordable and easy-to-use solution that improves inventory efficiency, saves space, and reduces human error in managing stock.

**1.2 Motivation / Other Approaches**

Traditional inventory management methods, including manual tracking and simple software, often fail to keep up with the demands of modern retail. Many stores continue to struggle with the accumulation of unsold goods, leading to waste, especially for perishable items. Moreover, businesses frequently face stockouts of high-demand products, resulting in lost sales and frustrated customers.

Automated inventory systems are available, but many are either too expensive or too complex for small to mid-sized stores. These systems often focus on large-scale enterprises, offering features that small businesses may not need, making them difficult to implement. As a result, many store owners rely on outdated methods, leaving them vulnerable to inventory issues such as overstocking, waste, and missed sales.

The goal of this project is to develop a system that addresses these problems without overwhelming store managers. By focusing on key inventory management features – such as FIFO, automatic reordering, and error minimization, this project offers a solution that is both affordable and effective, enabling small and medium-sized retail stores to manage their stock more efficiently.

**1.3 Description of Product**

The project addresses the need for better inventory management by designing a system that automates key processes and minimizes common inventory issues. The product aims to implement FIFO effectively to prevent waste due to expiration, prevent overstocking by accurately predicting demand, and avoid stockouts of high-demand items. By automating orders when stock levels drop below a set threshold, the system ensures that stores only order the necessary amount of goods, optimizing both storage space and capital.

The system will feature automatic stock tracking, real-time alerts, and simplified reorder processes to reduce the reliance on manual input and human decision-making. Store managers will be able to view real-time inventory data, monitor stock levels, and receive notifications when items need to be reordered. This approach not only reduces waste but also saves space in the store warehouse by preventing the storage of excessive inventory.

While the system’s core focus will be on small to medium-sized stores, it is designed to be scalable and adaptable to different types of retail environments. As the platform evolves, additional features may be added, such as advanced demand forecasting and integration with supply chain systems, but the primary goal remains the same: to streamline and optimize the inventory management process.

**1.4 Significance**

This project is significant because it offers an accessible and cost-effective solution to common inventory challenges in retail. Unlike complex, expensive enterprise systems, this system focuses on simplicity and practicality, addressing the needs of smaller stores. It helps store managers prevent stockouts and overstocking, optimize their warehouse space, and reduce waste, all while minimizing human error in the process.

By automating stock reordering and implementing FIFO, the system makes inventory management more accurate and less time-consuming. Store owners and managers will be able to make better decisions based on real-time data, ensuring they only order what is needed and avoid unnecessary expenses. This approach not only improves operational efficiency but also enhances customer satisfaction by keeping popular items in stock and reducing expired goods.

The novelty of this work lies in its focus on simplicity and efficiency, making it an ideal solution for small and mid-sized retail stores. The project introduces smart inventory management features without the complexity of large-scale enterprise systems, providing a practical and user-friendly tool that improves store performance and reduces costs.

1. Adam Ujazdowski, “Poles Still Waste 5 Million Tons of Food Annually Despite Growing Awareness”, Poland Insight, November 2024, <https://polandinsight.com/poles-still-waste-5-million-tons-of-food-annually-despite-growing-awareness-32882/> [↑](#footnote-ref-1)