NJIT New Jersey's Science & Technology University

Professor Vassilka Kirova
Spring 2025 – IS663102
System Analysis and Design
Project Team APM
February 19th, 2025

Problem Statement

Introduction:

In today's fast-paced digital economy, consumer expectations for instant delivery services have risen dramatically. Traditional grocery delivery models struggle to meet these demands due to inefficiencies in warehouse allocation, inventory management, and delivery logistics. The need for an ultra-fast, technology-driven grocery delivery system is essential to remain competitive in the market.

Problem Background:

Current delivery services rely on centralized warehouses and standard last-mile delivery logistics, which result in longer fulfillment times. Traffic congestion, inefficient routing, and manual order processing further contribute to delays. As a result, businesses face challenges in meeting the growing demand for near-instant grocery deliveries, leading to reduced customer satisfaction and loss of market share.

Problem Statement:

The primary challenge is the inability to fulfill grocery orders within 10 minutes due to outdated logistics models, slow inventory processing, and inefficient delivery routing. Without a solution that integrates proximity-based warehouse allocation, optimized routing, and real-time traffic updates, businesses will continue to fall short of consumer expectations.

Objectives:

To address this issue, the proposed solution will:

- Implement Proximity-based Warehouse Allocation by utilizing strategically placed Micro-Fulfillment Centers (MFCs) to reduce order fulfillment time.
- Optimize AI-driven Delivery Routing to ensure the fastest possible routes for drivers.
- Integrate Real-time Traffic Updates to dynamically adjust routes and minimize delays.
- Establish Priority-based Order Fulfillment, ensuring urgent orders are processed first.

- Enhance automation through AI-powered picking, packing, and driver assignment systems to streamline operations.

Expected Benefits:

- By implementing these solutions, the system will:
- Reduce delivery times to under 10 minutes, ensuring higher customer satisfaction.
- Increase operational efficiency by automating warehouse and delivery processes.
- Improve business profitability by minimizing delays and optimizing logistics.
- Enhance competitive advantage in the ultra-fast delivery market.

Conclusion:

A 10-minute grocery delivery system powered by AI, automation, and strategic warehouse placement will revolutionize the industry. By addressing inefficiencies in traditional delivery models, businesses can enhance customer experience, gain a competitive edge, and meet the evolving demands of modern consumers.