

# Progress Report 4

## Intelligent Business Analytics System for Maximizing Revenue and Efficiency

Student Name: Seungyeol Chae  
Student Number: 300362271

### Work Logs

Date	Hours Worked	Description of Work
March 24	3	Refactored file_processing.py to support multiple Excel formats. Validated flexible data ingestion for both sales and restaurant orders.
March 27	4	Improved data visualizations: updated demand forecasting and revenue chart UI with clearer LSTM/Prophet results. Added safeguards for missing or malformed backend responses.
March 27	2	Fixed frontend bug in MarketBasket and SalesAnomalies due to incorrect response structure. Registered missing Chart.js elements.
March 28	3	Implemented summary-only view for customer sentiment and segmentation to reduce UI overload with large datasets.
March 29	3	Added “Reset Data” button to clear all uploaded data from the database. Integrated reset endpoints for both sales and restaurant orders.
March 29	3.5	Extended weather impact to show 7-day forecast with a line graph. Created new weather_analysis logic with mock data generation.
March 30	3	Resolved weather impact import issue in FastAPI. Refined error messages and environment setup (API keys, CPU device handling).

---

# Progress Since Last Report

Since Progress Report 3, these features and improvements have been implemented

## 1. Customer Sentiment Summary

- Reworked sentiment analysis frontend and backend to only display summarized reviews grouped by item, rather than individual reviews.
- Summary now includes positive and negative counts along with percentage of negative/positive feedback.
- Display is compact and much more readable for large datasets.

## 2. Weather-Based Revenue Forecast (7-Day Forecast)

- The /weather-impact/ feature now forecasts predicted revenue for the next 7 days using mock weather data.
- Implemented a new line chart frontend using Chart.js to display revenue impact over time.
- Backend uses random but realistic temperature and humidity values for simulation.

## 3. Database Reset Functionality

- A "Reset Data" button has been added to the dashboard.
- Backend endpoints (/reset-sales-data/ and /reset-restaurant-orders/) clear the respective databases.
- Useful for testing and managing large datasets without manual intervention.

## 4. Customer Segmentation Display Optimization

- Instead of showing all rows of raw data, the segmentation view now displays a compact summary per cluster group.
- Added clear labels for each segment, such as "💎 VIP Customers" and "🛒 Low-Spend Shoppers".

## 5. Mock Dataset Enhancements

- Created and uploaded a large, well-structured Excel mock file for restaurant orders.
- This file enabled testing and verification of all AI-powered features including LSTM forecasting, sentiment, market basket, and anomaly detection.

---

## Issues Encountered & Fixed

- **Data Upload Errors:** Fixed column mismatch issues in `file_processing.py` by improving validation and renaming logic.
- **Sentiment API Format:** Adjusted frontend to correctly process and summarize new sentiment result structure from backend.
- **Chart.js Errors:** Fixed missing chart element imports (`chartjs-adapter-date-fns`, `bar/line` elements).
- **Uvicorn ImportError:** Resolved backend crash due to stale or incorrect function import by updating `weather_analysis.py`.