

Analysis and Development Report:

AI-Powered Daily Revenue

Prediction

Model

Prepared by: Mohamed Hassan

Date: October 2025

Abstract

This report provides comprehensive documentation of the development process for a MachineLearning model aimed at predicting daily revenue, deployed within an interactive dashboard using Streamlit. It covers the stages of Exploratory Data Analysis (EDA), the application of advanced feature engineering techniques (Polynomial Features), model training (XGBoost), and critically, the resolution of critical coding issues encountered during deployment to ensure the accuracy and integrity of the dashboard functionality.

Table of Contents

1. Exploratory Data Analysis (EDA)
2. Feature Engineering and Model Construction
3. Documentation of Streamlit
4. Dashboard Adjustments and Fixes
5. Conclusion and Recommendations

1. Exploratory Data Analysis (EDA)

The `source_code.py` script was utilized for data processing, preparation, and identifying the relationships between variables. The data analysis revealed several key insights:

1.1 Statistical Feature Analysis

Figure 1: Correlation Matrix between Daily Revenue and other variables.

The matrix highlights:

- Moderate Correlation: Most derived temporal variables (e.g., `Date_Of_Day`, `Month_Number`, `DayOfWeek_number`) show relatively low correlations with Daily Revenue.
- Strongest Predictors: `Ad_to_Revenue_Ratio` and `Revenue Change` exhibit the strongest correlation with Daily Revenue, underscoring their critical importance in the prediction process.

1.2 Categorical Feature Distribution