AI MODEL CARD

Institute of Analytics
The Global Body for Analytics

Model Name

Retail Analysis

Model Date and Version

Built May 2025
Version 1.0

This model's training concluded in May 2025, and it has not received subsequent updates. Any future revisions will be notified.

Overview/Model Type

This model is a pre-trained analytical system that uses K-Means and Linear Regression to identify and predict customer churn in the retail sector. It is part of an initiative to improve customer retention and optimize marketing strategies through ethical AI.

Questions or Comments:

For questions or comments, reach out to 220417@softwarica.edu.np.

Primary Intended Users

Retail managers, marketing teams, customer relationship management (CRM) specialists, business analysts, and executives focused on customer retention and sales growth within the retail sector.

Primary Intended Uses

This model is designed to identify and predict customer churn, helping retail businesses optimize customer retention strategies and personalize marketing efforts. It supports data-driven decision-making to enhance customer loyalty and maximize long-term revenue.

Out-of-Scope Uses

This model shouldn't be used for high-stakes decisions like individual creditworthiness assessments, setting dynamic pricing that unfairly targets specific customer segments, or making automated decisions about employment. It's not designed to process or analyze sensitive personal financial data or protected demographic information for discriminatory purposes.

Limitations

This model's effectiveness depends on the quality and breadth of the retail data it's trained on. It might not perform well if customer behavior patterns shift dramatically due to unforeseen events, like major economic downturns or significant market disruptions. The system isn't real-time and doesn't update dynamically. Currently, its support is limited to a specific number of retail chains or regions.

Metrics

The model's performance was evaluated using Accuracy, Precision, Recall, F1-Score, and AUC-ROC. These metrics were calculated to assess its ability to correctly identify and predict customer churn on held-out test sets. The model is optimized for high predictive power in identifying churners while maintaining interpretability and robustness across diverse customer segments and transactional data.

Training and Evaluation Data

The model was trained on anonymized transactional and customer interaction records from retail operations. Data included fields such as anonymized customer IDs, purchase history (e.g., transaction dates, product categories, total spend), loyalty program engagement, customer service interactions, and geographic region. No personal, sensitive, or demographic data was used.

Quantitative Analysis

Accuracy and Reliability

The model performs reliably within the scope of its training data. It generalizes well to similar retail customer segments but may not be suitable for rare or extreme cases of market disruption. Predictions are designed to assist with strategic planning and customer engagement rather than replace human judgment.

Precision

As a classification model, Precision measures the accuracy of positive predictions (true positives / (true positives + false positives)). This ensures that customers identified as potential churners are highly likely to churn, enabling efficient allocation of retention resources. Outputs are typically churn probabilities, converted to a binary (churn/no churn) for use.

Recall

For classification, Recall measures the proportion of actual churners correctly identified (true positives / all actual churners). Vital for minimizing missed opportunities to intervene.

Ethical Considerations

The model does not collect or use any personally identifiable or sensitive data. It was developed under a strict ethical framework to ensure privacy, fairness, and transparency. Predictions are explainable and presented in a way that enables human oversight. The model is intended to support, not replace, decision-makers in the retail ecosystem.

Feedback

Users are encouraged to provide feedback on the model's performance and usability. Please contact 220404@softwarica.edu.np to report issues or suggest improvements. A response will be provided within 48 hours of submission

Additional Notes and Any Other Relevant Factors

The model was developed with the support and insights of leading retail industry experts, whose contributions helped align the system with real-world customer retention challenges. The project was supervised by Mr. Manoj Shrestha. The model is open-source and can be adapted for use in similar retail markets or business contexts.