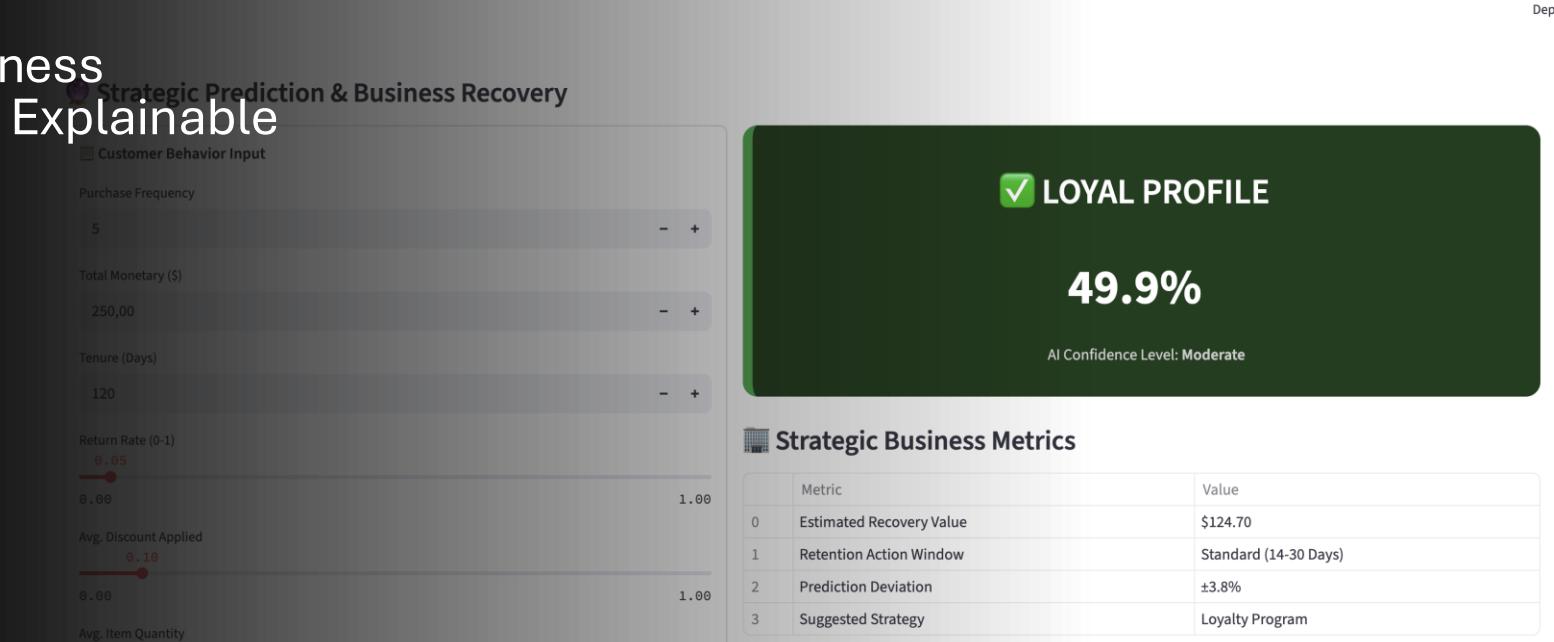
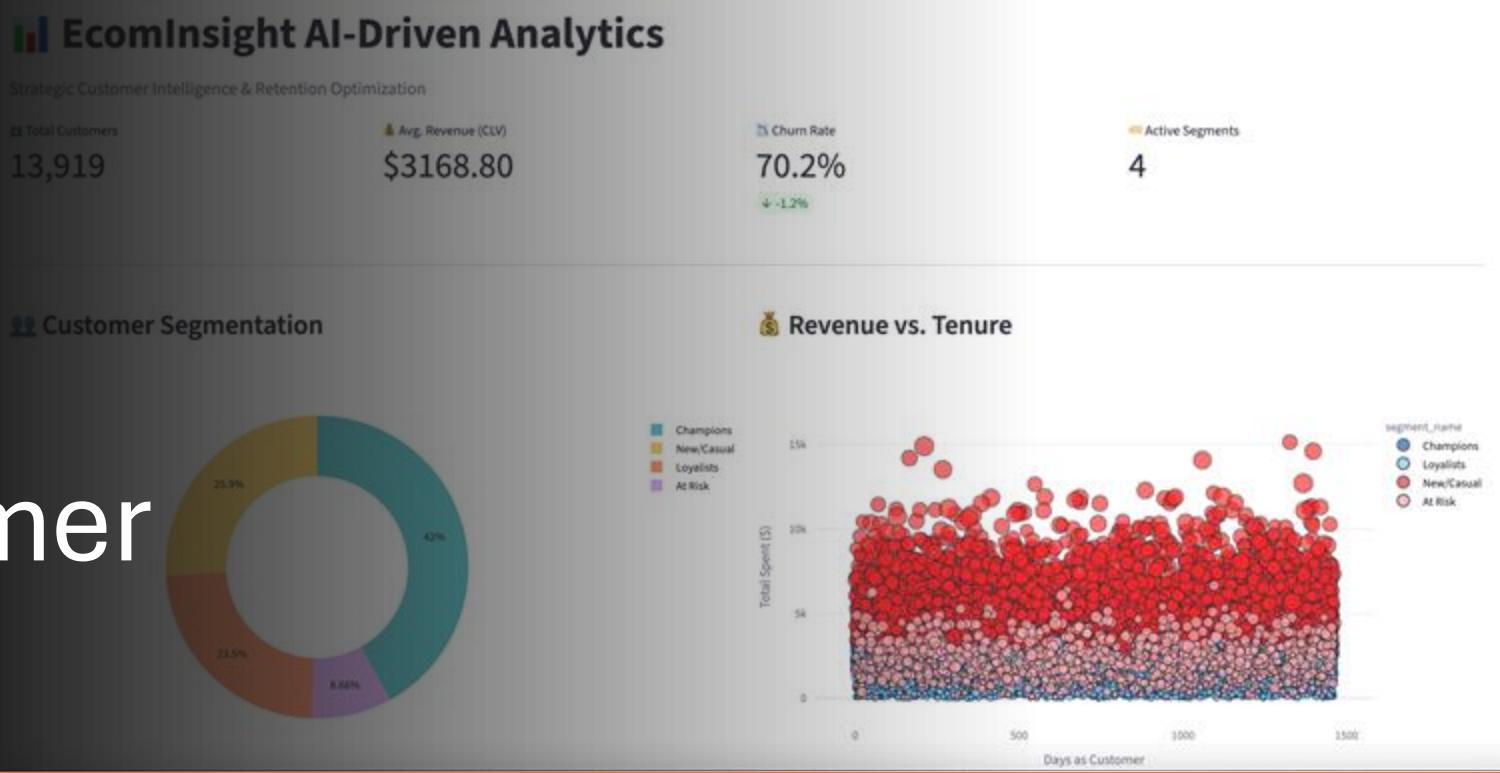


EcomInsight AI: Predictive Customer Retention Suite

Turning Big Data into Strategic Business Decisions with Machine Learning & Explainable AI.

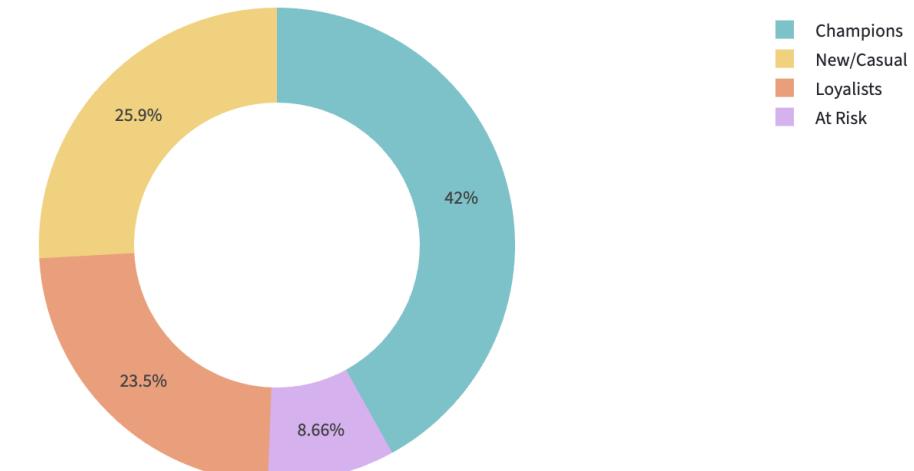
By Melek IKIZ



Executive Summary

In the e-commerce landscape, acquiring a new customer is five times more expensive than retaining an existing one. EcomInsight AI is engineered to detect subtle 'churn signals' hidden within vast data streams before they manifest. Unlike traditional analytics, this system doesn't just predict *who* might leave; it quantifies the potential financial impact and delivers actionable recovery strategies in seconds.

Customer Segmentation



EcomInsight AI-Driven Analytics

Strategic Customer Intelligence & Retention Optimization

Total Customers

13,919

Avg. Revenue (CLV)

\$3168.80

Churn Rate

70.2%

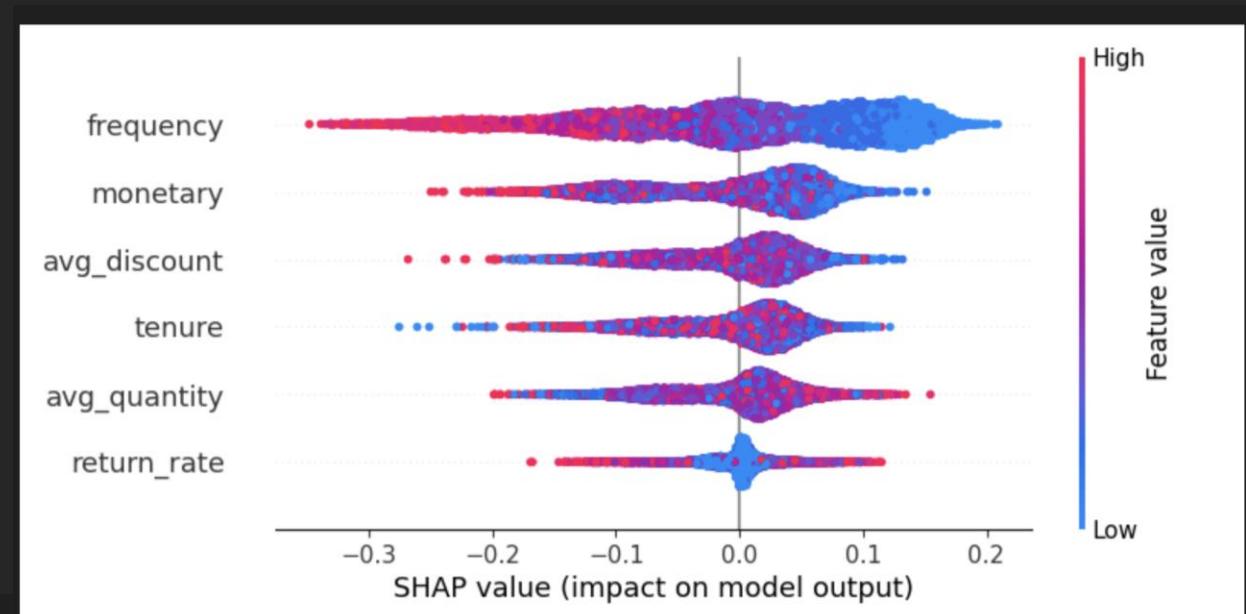
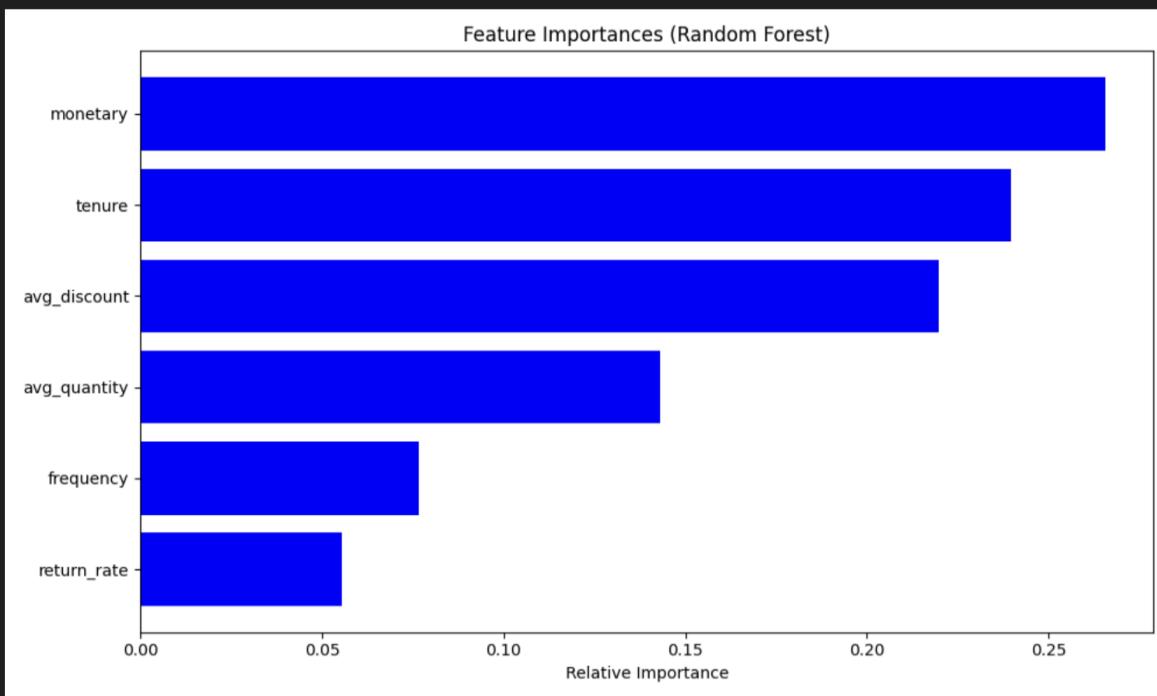
Active Segments

4

-1.2%

Technical Foundation & Model Explainability

- **Data Ingestion:** Behavioral features (Recency, Frequency, Monetary).
- **Machine Learning Core:** LightGBM Classifier + K-Means Segmentation.
- **Deployment:** FastAPI Service (Backend) & Streamlit Dashboard (Frontend).



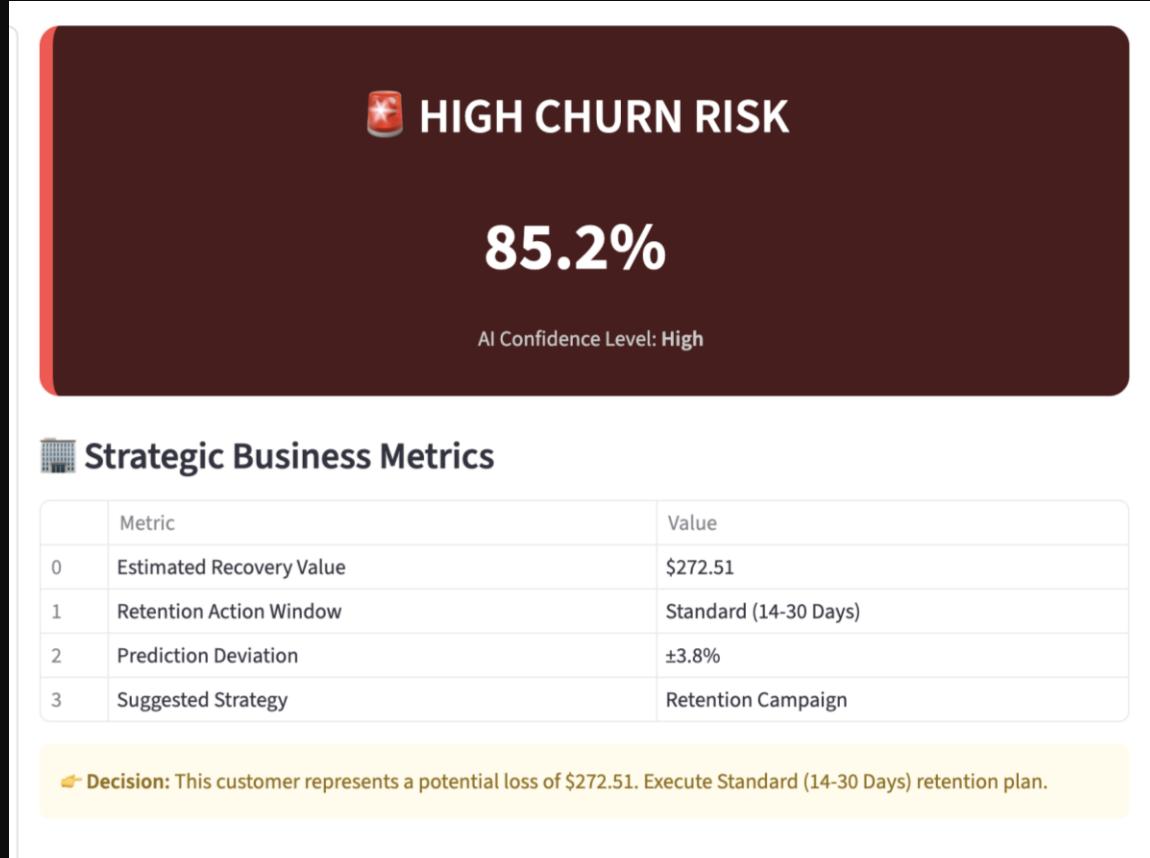
Frequency and Monetary are the top positive drivers of loyalty

"Why the AI Decided?" (SHAP / Feature Importance)

- **Interpretability:** Using SHAP values, we visualize the impact of each feature on the final prediction.
- **Strategic Insight:** For instance, we can identify that 'Return Rate' has a higher weight in churn prediction than 'Tenure', allowing for targeted policy changes.

Business Impact & Strategic Recovery

- **Monetizing Predictions:** "The system goes beyond forecasting; it quantifies risk. By calculating the **Estimated Recovery Value**, we translate machine learning probabilities into real-world balance sheet protection."
- **Precision Retention:** "Automated advice on 'Retention Windows' ensures that high-value customers are prioritized, preventing revenue leakage through timely, data-backed interventions."



Conclusion & Technical Scalability

- **Model Performance:** *Engineered with LightGBM for speed and precision. Reached high classification accuracy on imbalanced customer data.*
- **Ready for Scale:** *The FastAPI-powered architecture is ready for enterprise integration, capable of handling thousands of requests per second.*