Trading Data Analysis and Performance Insights

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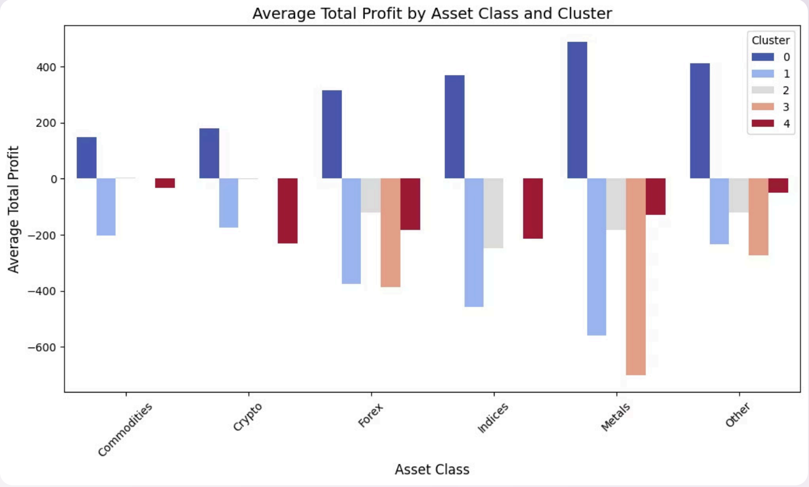
Objective: Leverage trading data analysis to identify profitable strategies, segment traders, and predict high performers for strategic decision-making.



Executive Summary

Objective

Analyze trading data to uncover trader behavior, segment traders, and predict performance using machine learning model.

Dataset

1083,719 trade records with metrics like profit, lot size, and trade duration, etc.

Key Findings

Identified 5 trader segments with distinct behaviors.

Developed Trader Quality Score (TQS) based on profit factor, win/loss streaks, and risk-reward ratio.

Achieved 99% accuracy in classifying high/low performers using XGBoost.

Recommendations

Incentivize high performers, retrain underperformers, and optimize XAUUSD strategies.

Data Analysis Insights

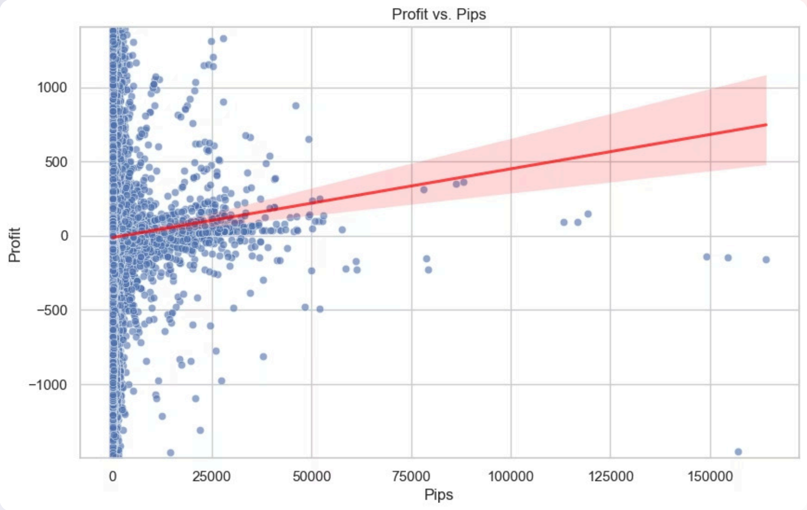
Dataset Overview

- 703,234 trades across Forex, Crypto, Metals, Indices, and Commodities.
- Key features: profit, lot_size, pips, trade_duration, symbol.

Findings

- High skewness in profit, lot_size, pips → Outliers trimmed (1st–99th percentiles).
- Strong correlation: profit vs. pips.
- XAUUSD shows high volatility; Action 0 outperforms Action 1.
- Short trades (<0.5s) dominate, but longer trades (up to 3.5s) yield higher profits.

Implication: Focus on high-pip, short-duration trades with Action 0 for profitability.



Trader Segmentation

Steady Performers

~20,000 traders, 55.08% win rate, $21.82 avg. profit: Consistent, low-risk.

Low-Activity Losers

~270 traders, 42.11% win rate, -$14.64 avg. profit: Low activity, consistent losses.

High-Volume Losers

~30,000 traders, 31.27% win rate, -$38.58 avg. profit: High activity, significant losses.

Aggressive Traders

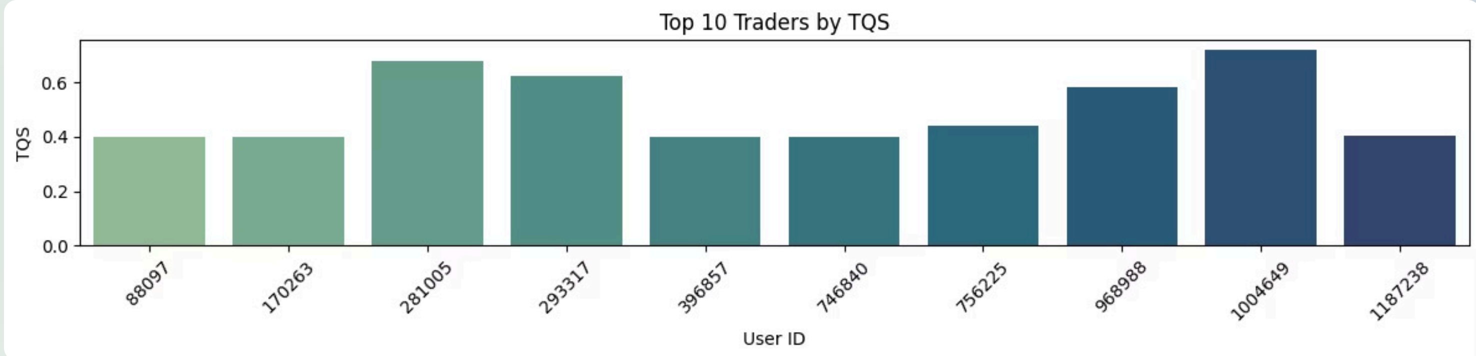
~15,000 traders, 51.82% win rate, -$6.56 avg. profit: High trade volume, moderate losses.

Niche Speculators

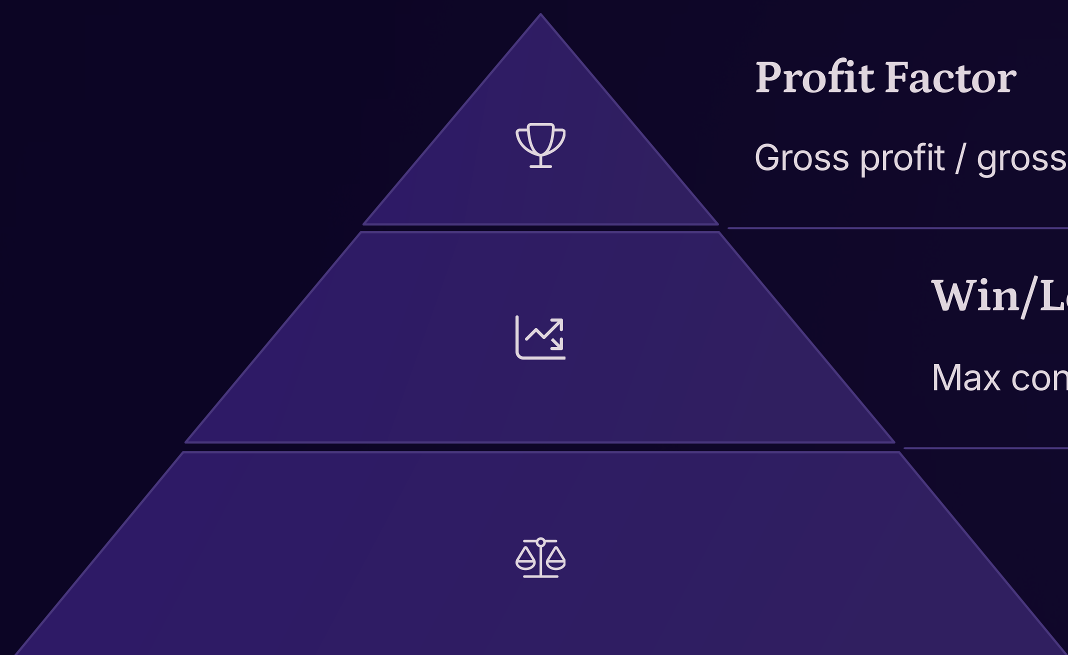
~32 traders, 30.02% win rate, -$21.94 avg. profit: High-risk, niche assets.

Methodology: K-Means clustering (k=5) on metrics like num_trades, win_rate, lot_size.

Insight: Steady Performers drive profitability; High-Volume Losers need intervention.



Trader Quality Score (TQS)



Profit Factor

Gross profit / gross loss (higher is better)

Win/Loss Streaks

Max consecutive wins vs. losses

Risk-Reward Ratio

Avg. win size / avg. loss size

TQS Formulation:

- Normalized metrics (MinMaxScaler, 0–1).
- Weighted sum: 30% profit factor, 20% risk-reward, 20% total profit, 15% win streak, 15% inverse loss streak.

Results:

- Top traders (e.g., user 1004649): TQS 0.72, 72.73% win rate, $8,051 profit.
- Bottom traders (e.g., user 1049141): TQS 0.10, 2.14% win rate, -$19,817 loss.

Implication: TQS ranks traders for targeted incentives and interventions.

Machine Learning Classification

Objective

Classify traders as high (top 25% TQS) or low performers

Models

Random Forest: 98% accuracy, XGBoost: 99% accuracy

Key Features

max_win_streak, win_rate, total_profit drive predictions

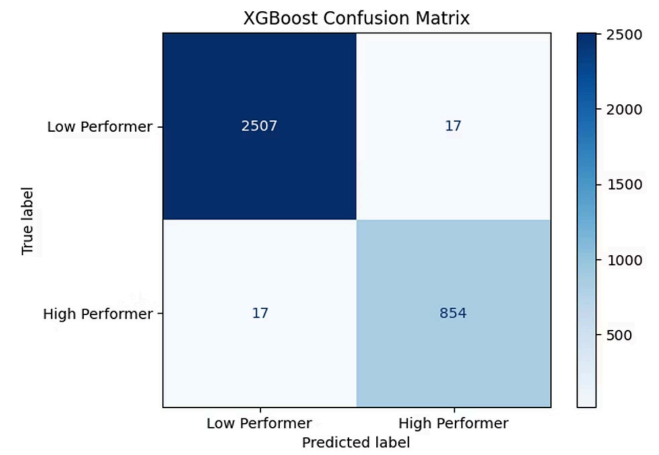
Models:

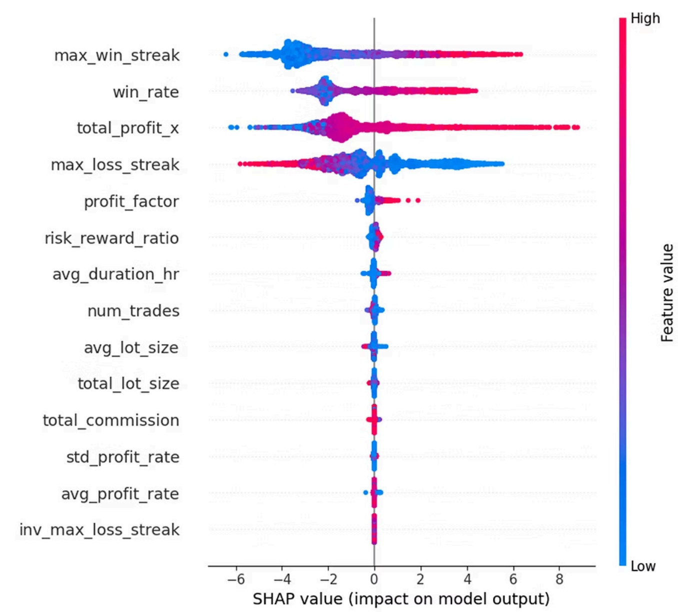
- Random Forest: 98% accuracy, 0.96 F1-score for high performers.
- XGBoost: 99% accuracy, 0.98 F1-score for high performers (preferred model).

Key Features (SHAP analysis):

- max_win_streak, win_rate, total_profit drive predictions.
- max_loss_streak, profit_factor also significant.

Insight: High performers are characterized by consistent wins and high profits; model is highly reliable.





Strategic Recommendations

Incentivize High Performers

- Reward Steady Performers (Cluster 0) with lower fees or premium tools.
- Promote top TQS traders (e.g., user 1004649) for capital allocation.

Retrain Underperformers

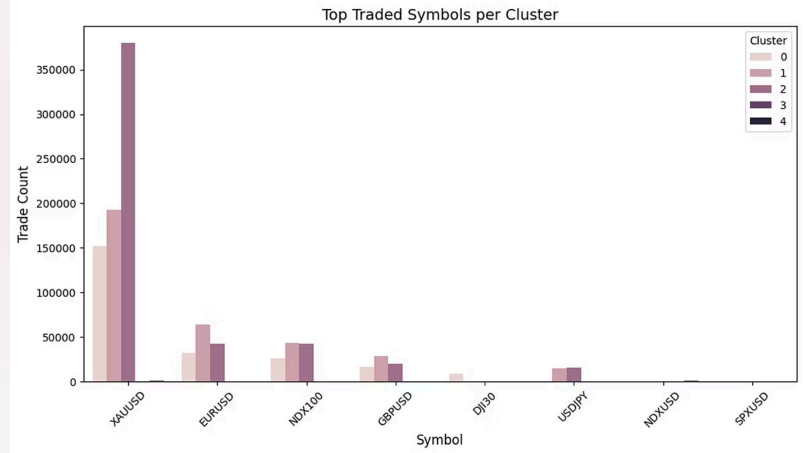
- Provide training for High-Volume Losers (Cluster 1) and Low-Activity Losers (Cluster 4).
- Cap trades for risky Niche Speculators (Cluster 3).

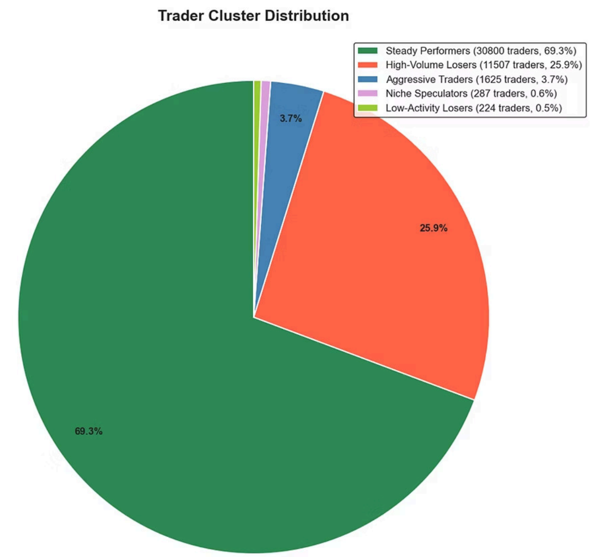
Optimize Trading Strategies

- Focus on XAUUSD and EURUSD (dominant symbols).
- Encourage short, high-pip trades with Action 0.
- Use automatic stop-loss/take-profit to reduce losses.

Platform Enhancements

- Integrate TQS and ML model into dashboards for real-time monitoring.
- Develop risk management tools for Cluster 1 and 4 traders.





Next Steps

Implementation

- Deploy XGBoost model for real-time trader classification.
- Build TQS-based leaderboards to motivate traders.
- Launch targeted training programs for underperformers.

Further Analysis

- Explore time-series patterns in trade frequency.
- Test additional metrics (e.g., Sharpe ratio, drawdown).
- Expand ML model to predict profit trends.

Stakeholder Engagement

- Schedule workshops with brokers and investors to align on incentives.
- Monitor regulatory compliance for high-risk traders (Clusters 3, 4).

Conclusion

Value Delivered

- Comprehensive analysis of 1083,719 trades reveals actionable insights.
- Trader segmentation and TQS enable targeted strategies.
- 99% accurate ML model supports confident decision-making.

Business Impact

- Enhance profitability by focusing on Steady Performers and XAUUSD.
- Reduce losses through retraining and risk management.
- Strengthen platform competitiveness with data-driven tools.

Call to Action

Approve implementation plan to drive trader performance and platform growth.