GameLens AI - Phase 1 Progress Report

Client-facing summary with accuracy assessment

Objective and scope

- Build an early-signal ROAS forecasting system using Unity Ads and Mistplay data to predict later-horizon ROAS (e.g., D15/D30) from D0–D7 signals.
- Deliver an interactive Streamlit app with training, predictions, recommendations, and a dynamic FAQ powered by model outputs.

Data ingestion and understanding

- Robust loaders for Unity Ads + Mistplay across Android/iOS with schema standardization and resilient path handling.
- Dashboard shows coverage by platform/type, record counts, missingness, and columns to highlight readiness.

Feature engineering

- Retention ladder D1–D7, deltas/slopes; ROAS ladder D0–D7 and growth ratios; level progression intensity; spend/revenue interactions.
- Platform/context encoding and leakage prevention for chosen horizons.

Forecasting model

- LightGBM quantile regression (q10/q50/q90) provides point and interval forecasts.
- UI exposes n_estimators, learning_rate, and max_depth.

Evaluation & explainability

- Metrics: R^2, MAPE, RMSE, MAE; CI coverage (share of actuals within [q10, q90]).
- Visuals: Actual vs Predicted, Residuals, CI samples; Top feature importance.

Recommendations engine

- Action labels vs target ROAS (Scale, Maintain, Reduce, Cut) with confidence details; CSV export.

Dashboard & UX

- Tabs: Data Overview, Feature Engineering, Model Training, Predictions, Recommendations, FAQ.
- Simple session-based login for reliability; dynamic FAQ answers from live metrics and predictions.

Deployment/readiness

- Local run documented; Render-ready; version-controlled with .gitignore, requirements, and env setup.

Accuracy assessment plan

- Time-based splits and group-aware CV; platform-stratified metrics; baselines (last ROAS, D0–D1 extrapolation, linear).
- Targets (to refine): for D30 ROAS, MAPE ≤ 20–30%, $R^2 \geq 0.35$–0.50; CI coverage ~80–85%.
- Metrics overall and by slice; spend-weighted errors; pinball loss and coverage for intervals.
- Rolling-origin backtests; calibration plots; ranking utility (Spearman).
- Monitoring post-deploy with retraining triggers on metric degradation.

Next steps

- Expand datasets/cohorts for walk-forward backtests; add campaign IDs to recs; optional geo/creative features; horizon expansion.
- Agree final acceptance thresholds and UAT cadence with client.