

■ Module: Coach Module

Type

Analytical and recommendation module for behavioral adaptation and operational growth.

🎯 Purpose

The Coach module provides real-time support to system participants by generating recommendations based on their actual behavior trajectories and comparisons with successful peers. It helps operators and drivers identify the root causes of issues, resolve them, and reach higher trust statuses (e.g., *validated*) without external consulting or punitive measures.

Within the Equinomix system, it functions as an adaptation layer that transforms behavioral analytics into actionable and comprehensible steps.

✖ Subsystem Structure

Subsystem	Function	Data Source
trajectory_monitor	Real-time tracking of participant behavior trajectory	Normality Corridor module
peer_success_mapping	Sampling of <i>validated</i> trajectories within similar context	normality_score, fsm_status
recommendation_engine	Generating actions based on causal analysis	Z-score, features, anomalies
status_feedback_linker	Linking recommendations to token status transitions	FSM token layer
compliance_logger	Logging explanations and ensuring audit compliance	SHAP, LIME
delivery_interface	Delivering recommendations via UI / Telegram / API	FastAPI, embedded UI
effect_monitor	Monitoring outcomes based on participant's post-recommendation actions	Normality Corridor (trajectory replay)

🔍 Algorithms & Methods

Method	Purpose
Peer Trajectory Matching	Match similar <i>validated</i> trajectories in comparable contexts
Causal Flag Extraction	Identify root causes of anomalies (e.g., fines → sleep deprivation)
Sequence Deviation Scoring	Detect divergence from optimal behavioral patterns
SHAP / LIME Explainability	Ensure transparency: why a recommendation was made
FSM Recommendation Trigger	Translate action into FSM token status updates if conditions are met

Data Sources


Source	Usage
<code>trajectory_layer</code>	Behavioral sequences of drivers and operators
<code>feature_engineering</code>	Metrics: fines, sleep schedule, maintenance, idle, fuel usage
<code>normality_scores</code>	Deviation from peer-group benchmarks
<code>fsm_token_status</code>	Current and historical participant token statuses
<code>validated_patterns</code>	Summary of successful trajectories from <i>validated</i> peer members

Implementation



Component	Technology
Analytics & Matching	Python (Pandas, scikit-learn, XGBoost, SHAP)
Recommendation Logic	Python module <code>coach_engine.py</code> (post-analysis hook)
Interface / API	FastAPI + Embedded Admin Panel + Telegram Alerts
Data Storage	Uses existing event store (no duplication)
Logging & Audit	JSON logging, SHAP / LIME




Operation Cycle & Feedback Loop

1. **Deviation Detection:** The Normality Corridor module flags a behavioral deviation.
2. **Coach Trigger:** `coach_engine` is invoked.
3. **Recommendation Generation:** A matching *validated* trajectory is found, key differences are analyzed, and a clear recommendation is produced.
4. **Delivery:** The recommendation is delivered via UI / Telegram.
5. **Acknowledgement:** The participant confirms receipt.
6. **Outcome Monitoring:** After 3–7 days, updated behavior is evaluated.
 - If improvements are observed → participant may transition to a higher status.
 - If not → the recommendation is repeated or escalated to the Access Layer.

 The participant does **not** rate the recommendation. Only receipt is confirmed. The effect is judged by actions.

Example Use Cases

Situation	Analysis & Recommendation
 Sleep Pattern Violation	Fragmented sleep between shifts detected. → Normalize rhythm by limiting late shifts.
 Excessive Maintenance Costs	High frequency of service calls & returns. → Check maintenance routines and spare parts.

Situation	Analysis & Recommendation
 Drop in Vehicle Utilization	A car's usage dropped while fleet average rose. → Reassign driver or adjust rental schedule.
 Repetitive Traffic Fines	Recurring fines of same type identified. → Training, route revision, shift adjustments.
 Operator Payment Delay	Payout rhythm disrupted despite good utilization. → Shift rescheduling or payment restructuring.

✅ Coach Module Benefits

For Operators:

- Clear steps on *what to do* and *why*.
- Improved profitability without added pressure.
- Real-time skill-building based on live data.

For Platform:

- Behavioral alignment without coercion.
- Reduced churn and higher ops quality.
- Sustainable growth in participant maturity.

For Investors:

- Lower operational risk.
 - Improved predictability of yield.
 - A mature environment fit for scaling.
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🔥 In Plain Words

Coach is your built-in digital mentor. It doesn't punish or block, but explains what's wrong, why it matters, and how to fix it — using real-life successful examples. All in clear language, with minimal delay and maximum impact.