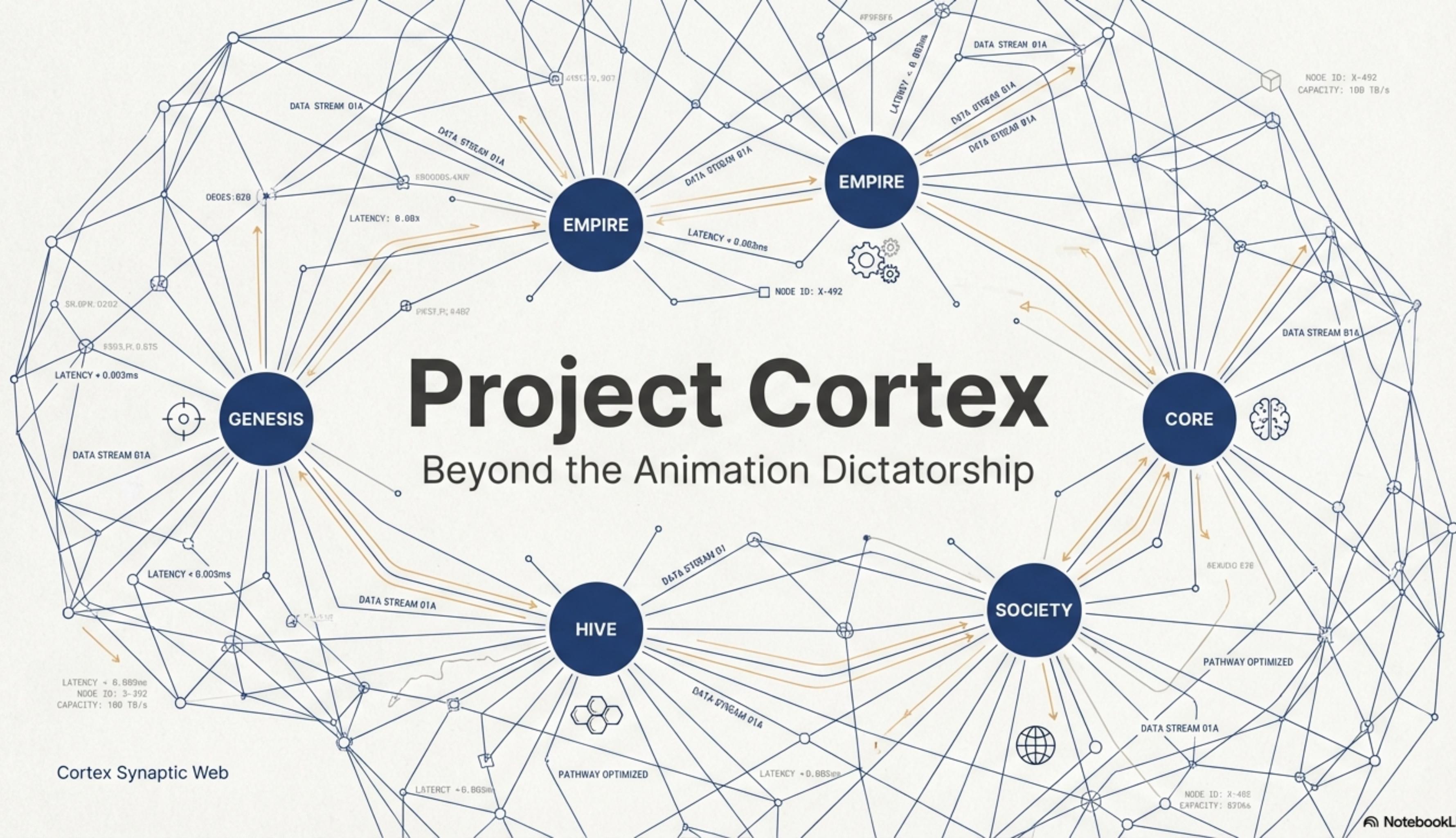


# Project Cortex

## Beyond the Animation Dictatorship

## Cortex Synaptic Web



# "Every draft is just me going, 'Alright, which one of ya fucks are actually good?'"

Current football simulations are failing their most dedicated users. The experience is defined by opaque systems, frustrating UIs, and a lack of strategic depth. The core loop feels more like a lottery than a test of skill.

## 🔍 On Scouting

"I do literally everything in franchise and this stupid user interface and loading sucks so bad that I can't even do it."

## 🧠 On AI

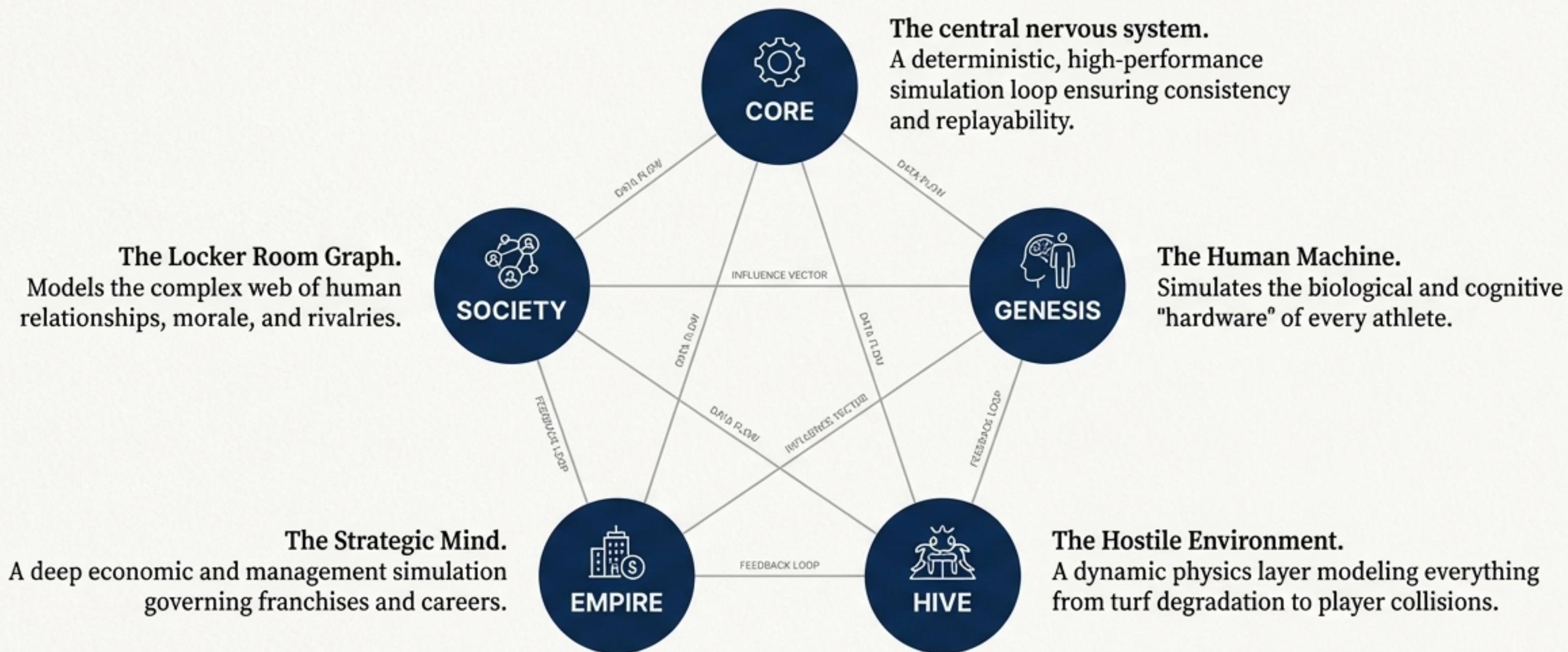
"AI is slow to react and prone to being exploited by simple offensive maneuvers like slant and cross routes."

## 💻 On Immersion

"I'll never forget loading up Madden as a kid and seeing the loft you can upgrade, your parents genetic background, media questions... I remember thinking 'wow just imagine what this game will look like in ten years!' Sure enough... it got worse."

The problem isn't a single feature; it's a foundational philosophy.  
Outcomes are scripted, not earned.

# The Cortex Engine: A Living NFL Simulation



These are not separate modes; they are interconnected layers of a single, unified simulation.  
Every action in one layer has consequences in the others.

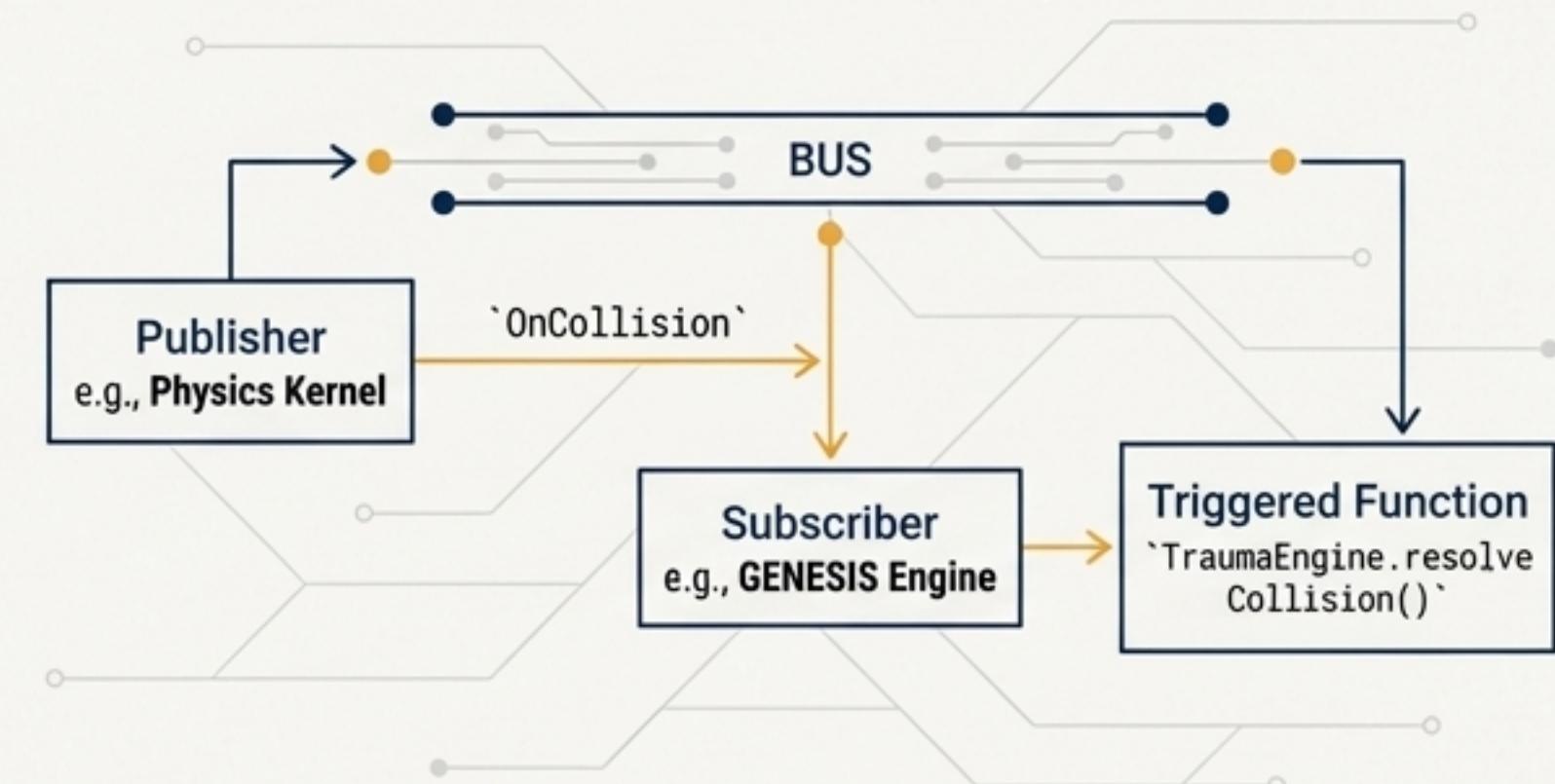
# The CORE Loop: Engineering a Deterministic Universe

To escape the “spiral of death” from variable hardware and ensure perfect replayability, the simulation is built on a **Fixed Time-Step** architecture and a decoupled **Event-Driven Architecture (EDA)**.

Tick Architecture

Tick Type	Frequency	Purpose	Synchronization
Micro-Tick	10 Hz	Physics, collision checks, individual player agent movement (Kinematics).	Independent of rendering frame rate.
Macro-Tick	Per Play	Updates persistent state (e.g., TurfPhysics.degradeZone(), Crowd.updateSentiment()).	Triggered by major FSM events.
Mega-Tick	Per Week	Long-term logic (healing, XP gain, financial calculations).	Controlled by franchise advancement actions.

Event-Driven Architecture (EDA)



Ensuring components are decoupled and modular.

# The GENESIS Engine: Simulating the Human Machine

GENESIS defines players as **biological** entities with **immutable physical and cognitive limits**, introducing **authentic risk** and differentiation.



## Biometric Hardware Scan

Models immutable traits like **Hand Size**, **Wingspan**, and **Fast Twitch Fiber %**.

*Example: Hand size < 9 inches increases fumble probability by 40% in cold weather.*



## S2 Cognition Layer

A hidden **S2 Score** dictates **Processing Latency**.

*Example: A low S2 score injects a >200ms delay into an AI's Behavior Tree, making them slow to read keys.*



## Detailed Injury Taxonomy

A hierarchical body-part map with `currentHealth`, permanent `chronicWear`, and specific torque/force thresholds for injuries like ACL tears.



## Physiological Engine

Models nutrition, hydration, and fatigue.

*Example: 'Salty sweaters' are more prone to 4th quarter cramping, a risk mitigated by in-game sodium intake.*

**Why:** Solves the problem of players feeling like interchangeable automatons. In Cortex, biology is destiny.

# From Bench Press to Biometrics: A Combine That Matters

## The Old Way

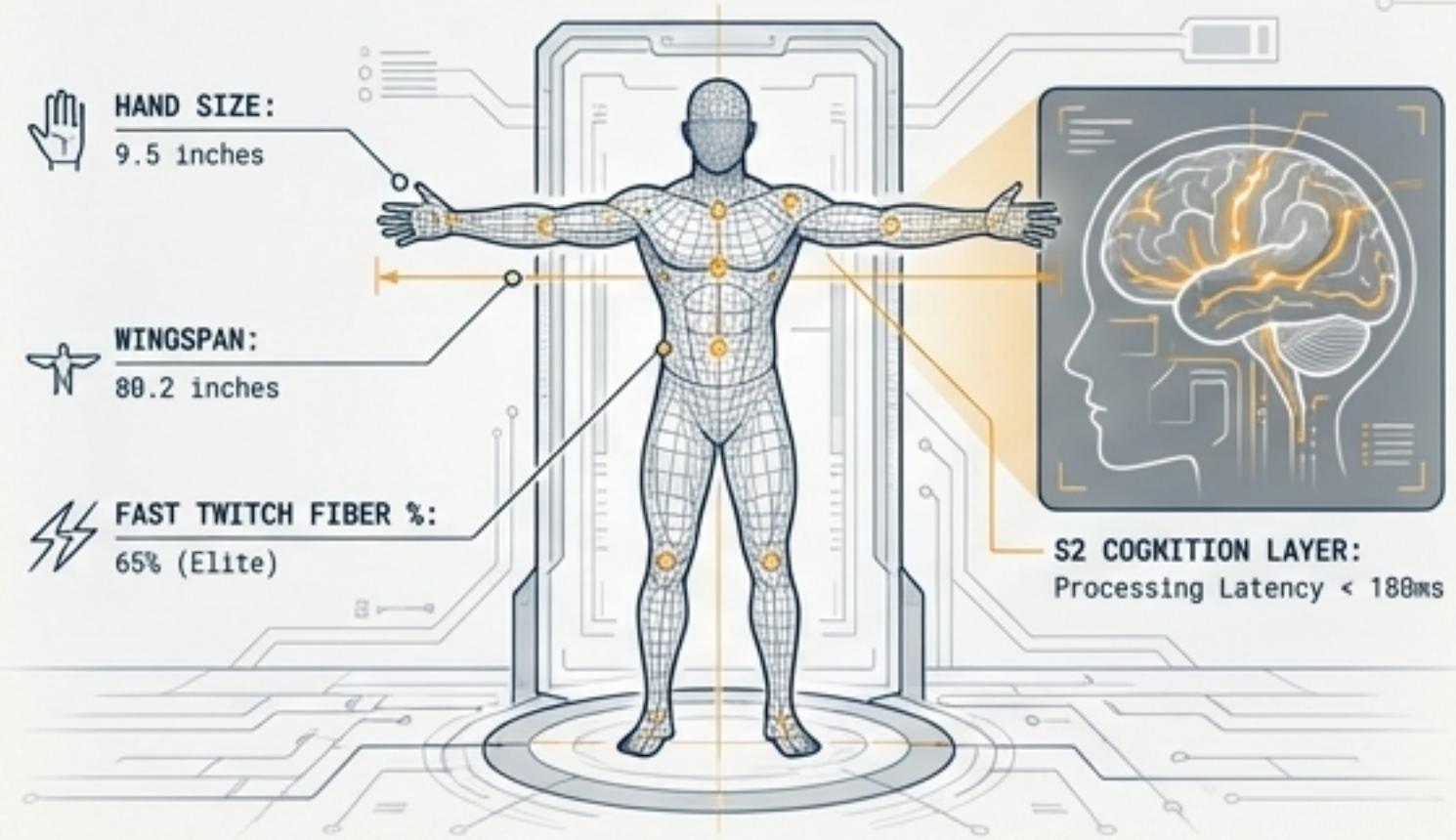


## The Critique

Users overwhelmingly want to "kill bench press," calling it a measure of endurance, not functional football strength.

"It really is only showing how strong a couple of muscle groups are."

## The Cortex Way



## A True Assessment

- **Measures What's Real:** Instead of bench reps, Cortex prioritizes metrics with proven predictive power.
- **GENESIS Integration:** The Combine reveals key BiologicalProfile data: hidden S2 Scores, Fast Twitch %, and flags for degenerative medical conditions.
- **Physics-Relevant Drills:** Focus shifts to user-suggested drills like the Power Clean to measure power and GPS-tracked speed during on-field workouts to capture true "game speed."

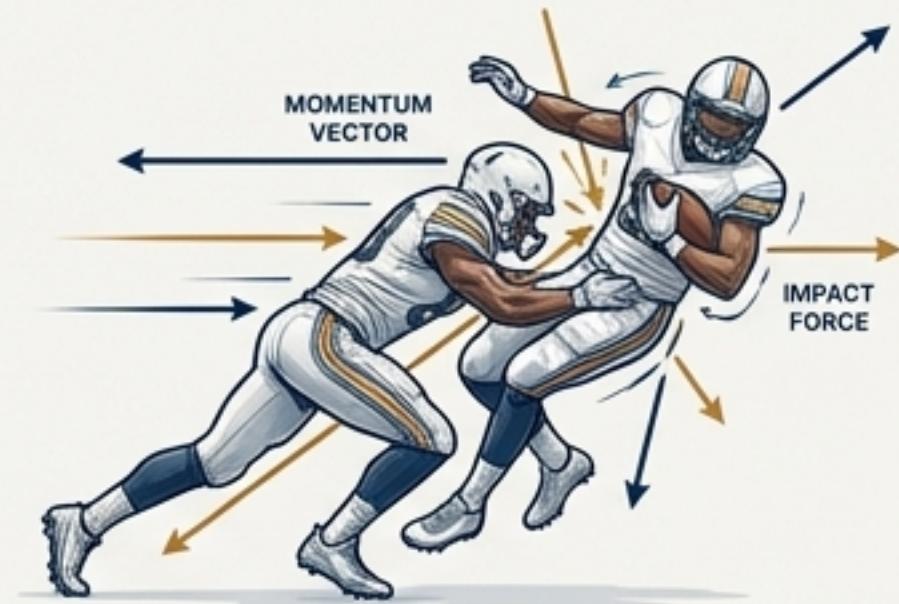
The Combine is no longer a mini-game; it's a critical data-gathering event for the GENESIS engine.

# The HIVE Engine: A Hostile, Dynamic Environment

HIVE models the stadium as an active environment where geophysical and physical factors dynamically impact gameplay.

## BOOM Tech Physics

A new, physics-driven system for tackling. It emphasizes **preservation of momentum** and uses **Driven Ragdoll** physics to create an Infinite variety of authentic, unscripted collisions.



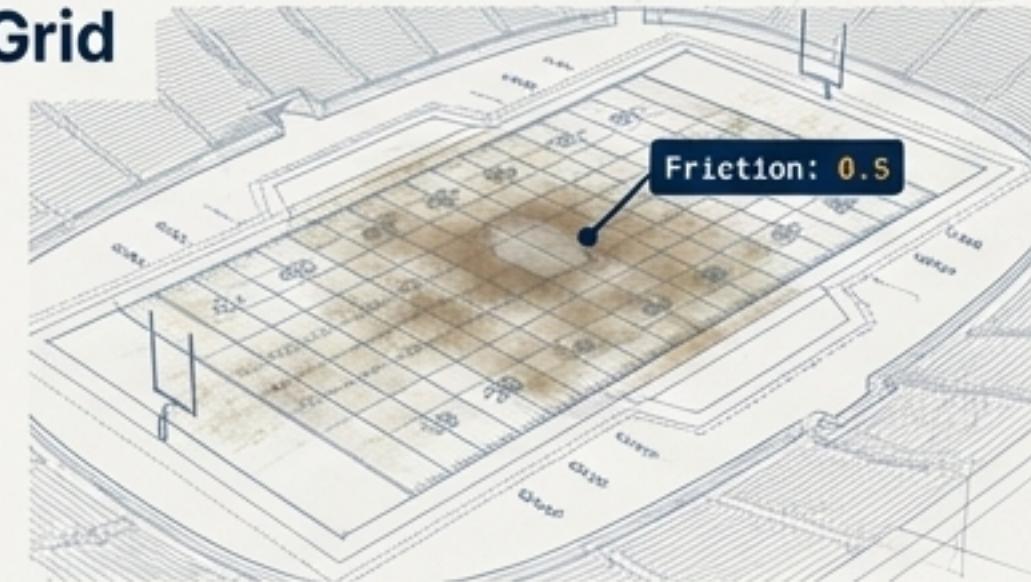
## Dynamic Weather Physics

Rain and snow are not just visual effects. They **alter the Turf Grid's friction** and **interact with equipment**, testing player attributes and grip.



## Turf Degradation Grid

The field is a 10x10 grid. High-traffic zones degrade, dynamically altering the **Friction Coefficient**. This directly impacts player locomotion and injury risk.



## Equipment with Stats

Cleats and gloves are no longer cosmetic. They modify base attributes, providing **trade-offs** (e.g., -2 Agility for heavy spiking, +2 Injury Resistance). High-grip grip gloves directly counteract negative friction from rain.

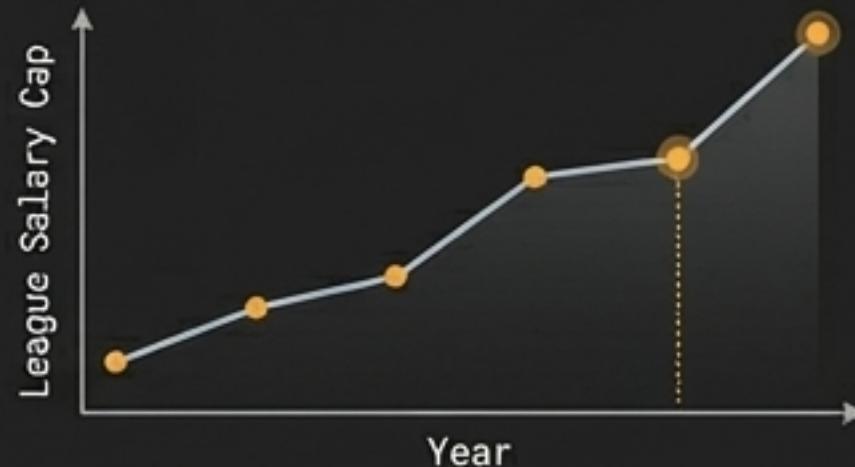


**Why:** Solves the 'Animation Dictatorship.' In Cortex, the outcome of every play is determined by physics, not a pre-selected animation.

# The EMPIRE Engine: The Strategic & Economic Gauntlet

EMPIRE models the complex financial and strategic realities of running an NFL front office, forcing GMs to make difficult, long-term decisions.

## Capologist Financial Physics



**DEAD MONEY CALCULATION:**  
PLAYER: J. DOE  
TOTAL BONUS: \$48M  
TERM: 4 YRS  
AMORTIZATION: \$10M/YR  
ACCELERATION: \$30M  
DEAD MONEY: \$30M (YEAR 2)

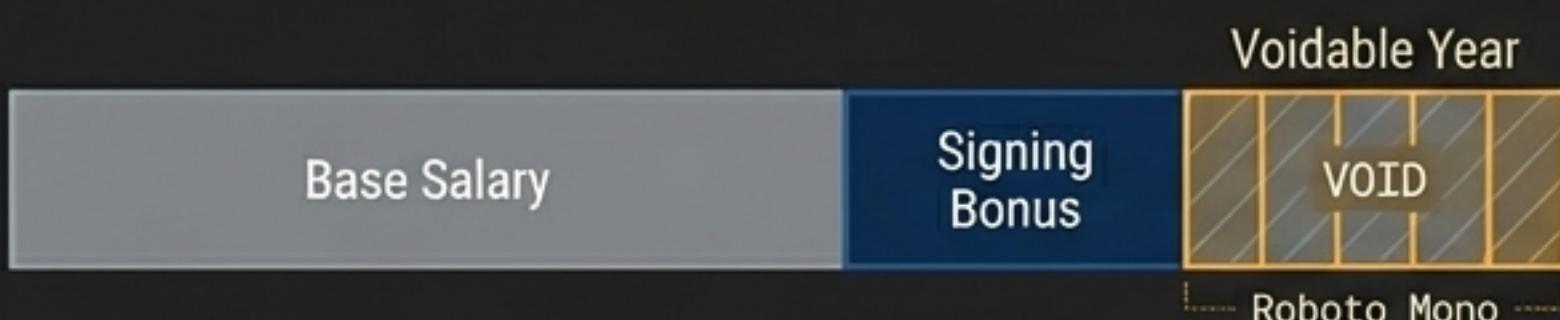
A **Dynamic Salary Cap** that grows realistically with league revenue...  
Features a **Time-Series Amortization Engine** to instantly and accurately calculate **Dead Money**...

## Utility AI for GMs



CPU GMs use **Utility AI** and **GOAP** (Goal-Oriented Action Planning) to make strategic decisions based on their team's 'Win Now' vs. 'Rebuild' status...

## Complex Contract Negotiations



Reintroduces **Restricted Free Agency (RFA)** logic and allows for custom contract structures like **front/back-loading** and **voidable years**.

## Adaptive Coach DNA



AI coaches learn from user tendencies (a modern **VIP System**). If you run 'Inside Zone' over 40% of the time, the AI will adapt its defensive focus...

# True-to-Life Scouting: An Intelligence War, Not a Checklist

Scouting in Cortex is a 12-month intelligence war. Information is incomplete, biased, expensive to improve, and full of risk.



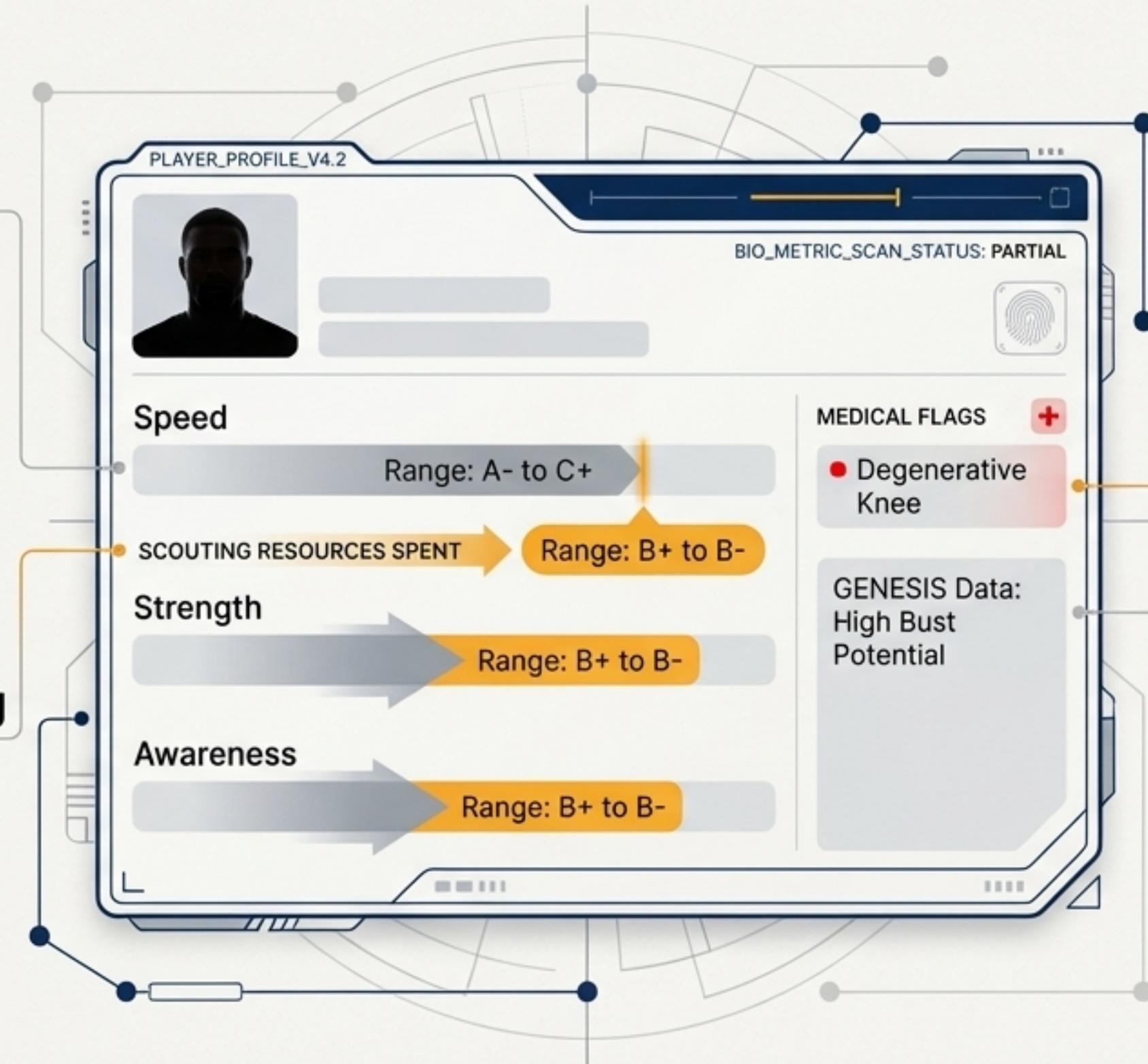
## Fog of War & Tiered Masking

Player ratings and development traits are hidden behind a 'Fog of War' noise filter. Attributes are revealed incrementally as scouting resources are spent, displayed as wide skill ranges that narrow over time.



## Interactive Qualitative Scouting

Restore GM agency with **GM-Led Pre-Draft Interviews** to assess scheme fit and personality. Re-integrate **Playable Combine** drills and the **Senior Bowl** to gain subjective insights into functional talent.



## Biometric & Cognitive Screening

Scouting is the *only* way to uncover critical **GENESIS** data. Spending premium resources on an MRI can reveal hidden **Medical Flags** (e.g., 'Degenerative Knee'), instantly flagging a prospect's bust potential.



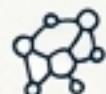
## Staff-Dependent Accuracy

Scout accuracy is tied to staff skill and specialization. A Tier-3 "DB Guru" will provide more accurate reports on cornerbacks than a generalist. Firing a scout has financial and morale consequences.



# The SOCIETY Engine: The Locker Room is a Living Organism

Models the human element of football, where morale, trust, rivalries, and mutiny directly impact on-field performance and team stability.



## Social Clique Graph

A weighted, undirected graph where players are nodes and Trust (0-100) forms the edges. Trust is built on shared PersonalityDNA (e.g., veterans trusting veterans).



## Nemesis System

A RivalryDatabase tracks player-pair histories. Facing a rival triggers +Aggression and +RiskTaking buffs, turning a regular game into a "Grudge Match."

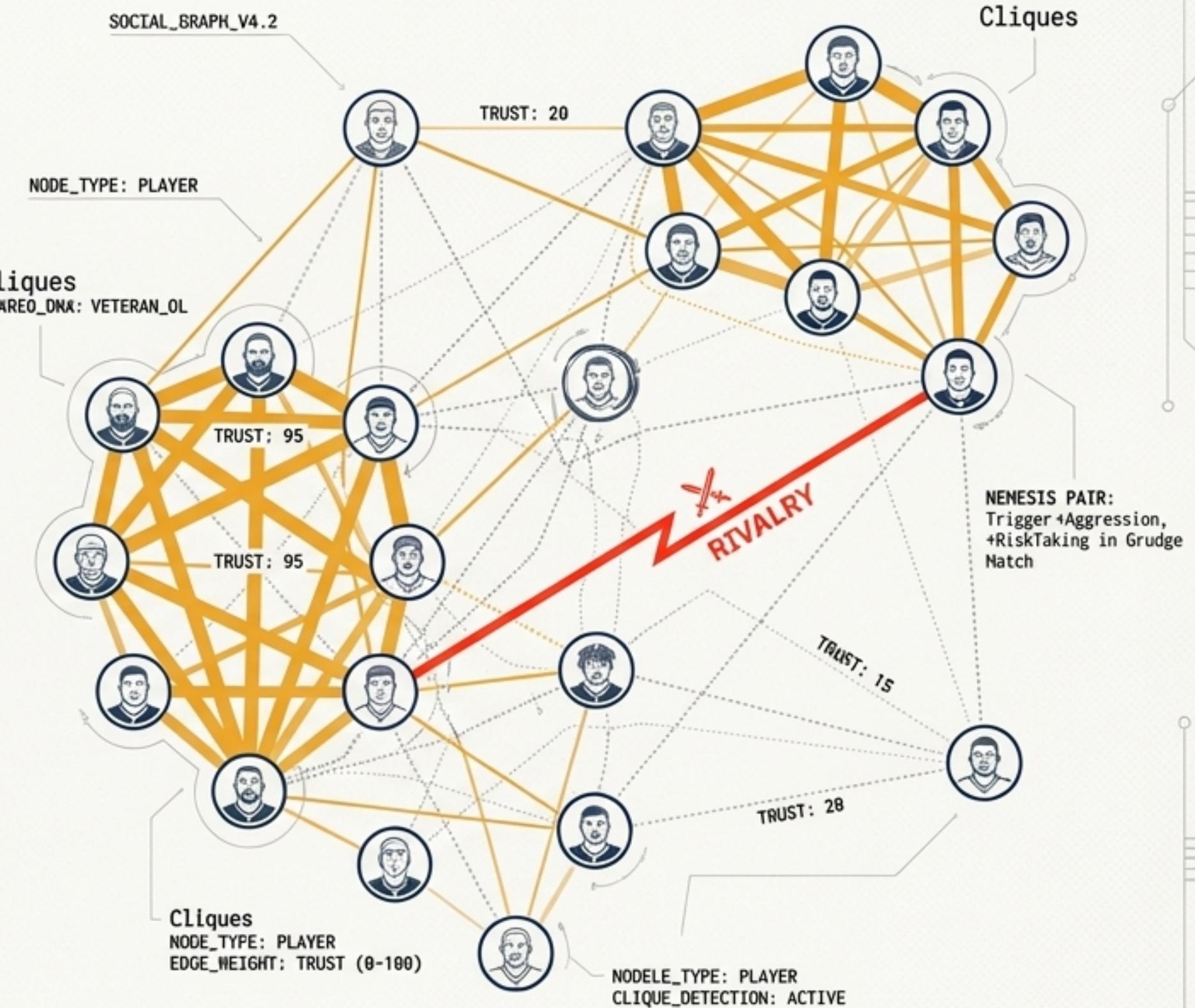


## Mutiny Cascade Logic

A "blast radius" algorithm simulates the spread of low morale. A disgruntled team leader can trigger a cascade, lowering the IntrinsicDrive of connected players in the social graph.

## The "Why"

Creates authentic, player-driven storylines that transcend the box score. A QB's performance might drop not because of stats, but because he's lost the trust of his offensive line.



# The Cortex Synthesis: Hot-Swappable AI Brains

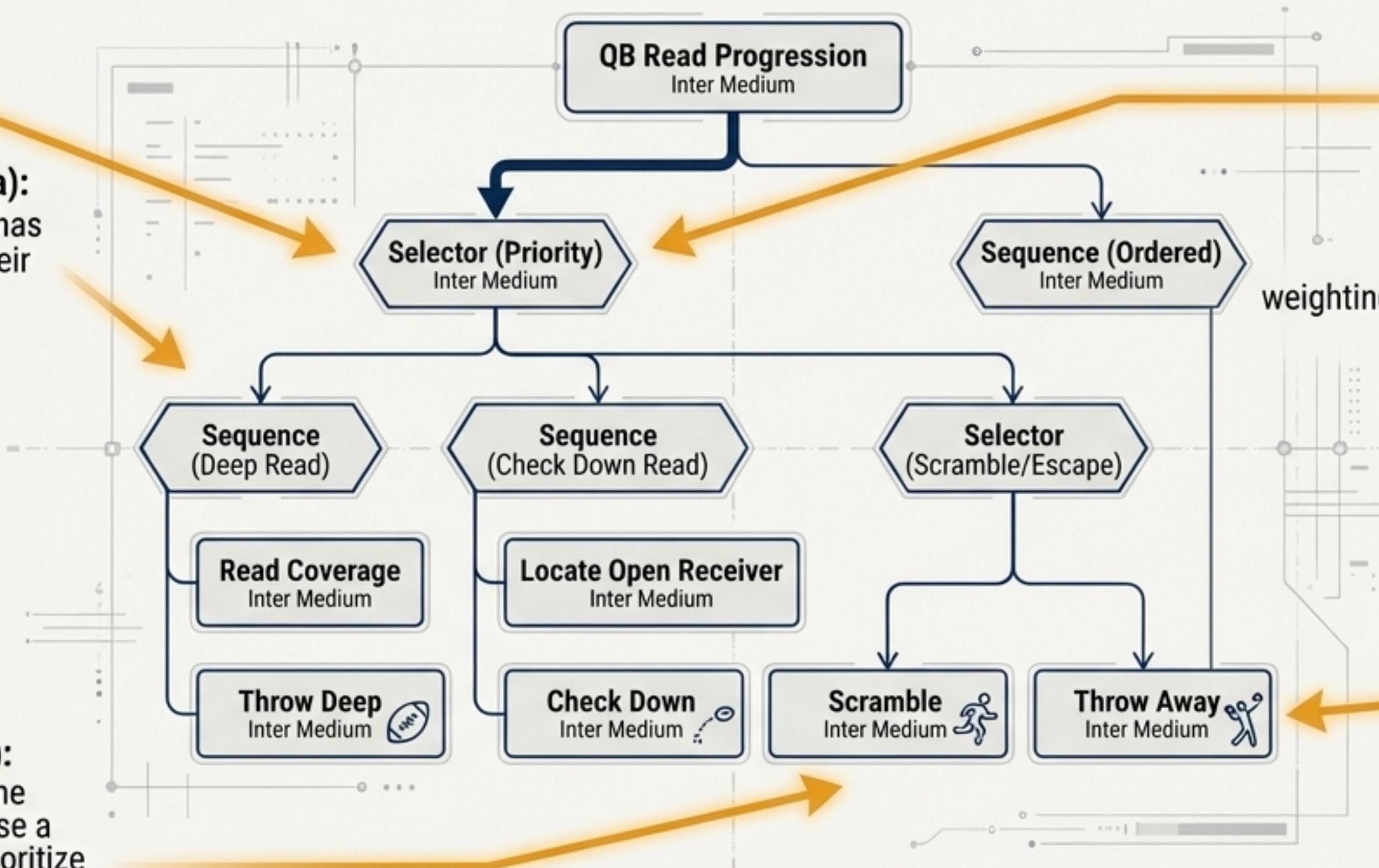
Player AI is not a rigid script. It's a modular **Behavior Tree (BT)** architecture where logic is dynamically weighted by the entire simulation state. We're replacing brittle Finite State Machines with **intelligent, reactive agents**.



**GENESIS (Cognitive Data):**  
A QB with a low **S2 Score** has a built-in latency before their BT executes this node.



**HIVE (Environment Data):**  
A heavily degraded turf zone from the **Turf Grid** will cause a running back's BT to de-prioritize 'Hard Cut' actions in that area.



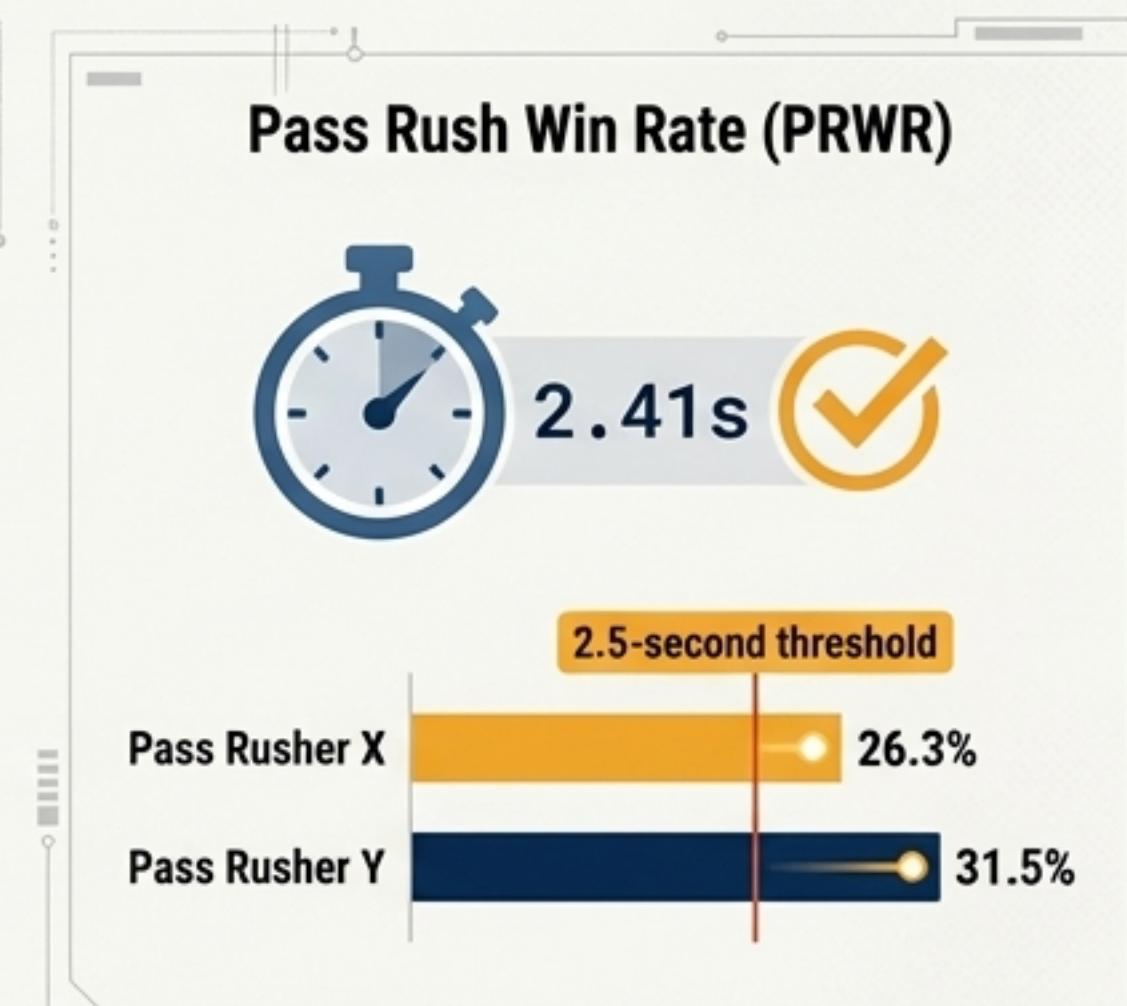
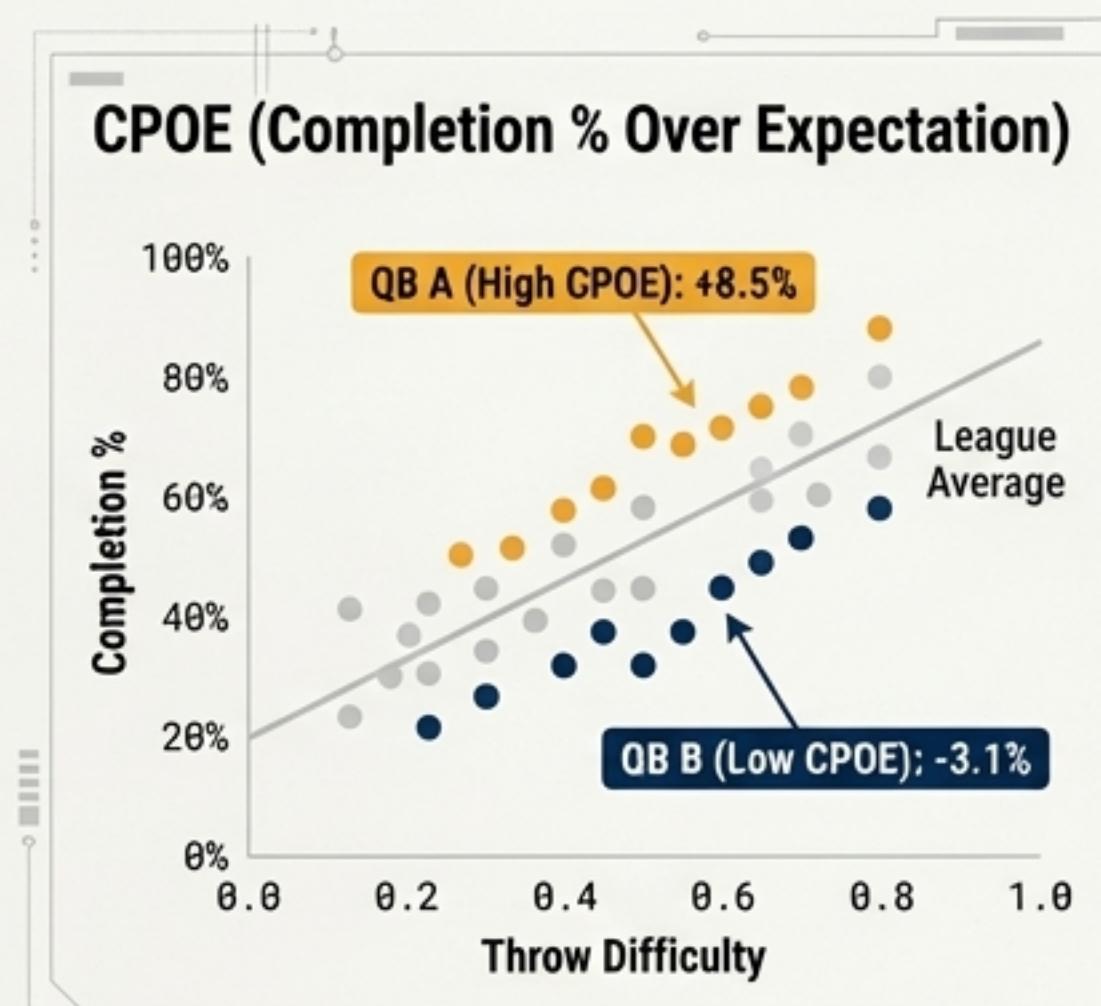
**EMPIRE (Strategic Context):**  
An AI coach with 'Aggressive' **Coach DNA** increases the weighting of the "Go for it on 4th" action node in their strategic BT.



**SOCIETY (Trust & Morale):**  
High **Trust** between a QB and WR1 increases the probability of the 'Force Throw to WR1' leaf node firing under pressure.

# The Output: Next-Generation Metrics, Natively Generated

Cortex doesn't just simulate the game; it simulates the data. The engine natively generates the advanced efficiency metrics used by real NFL front offices, transforming the 'eye test' into data-driven analysis.



Isolates a running back's individual skill by calculating the difference between actual yards and the expected yards based on the real-time location and speed of all 22 players.

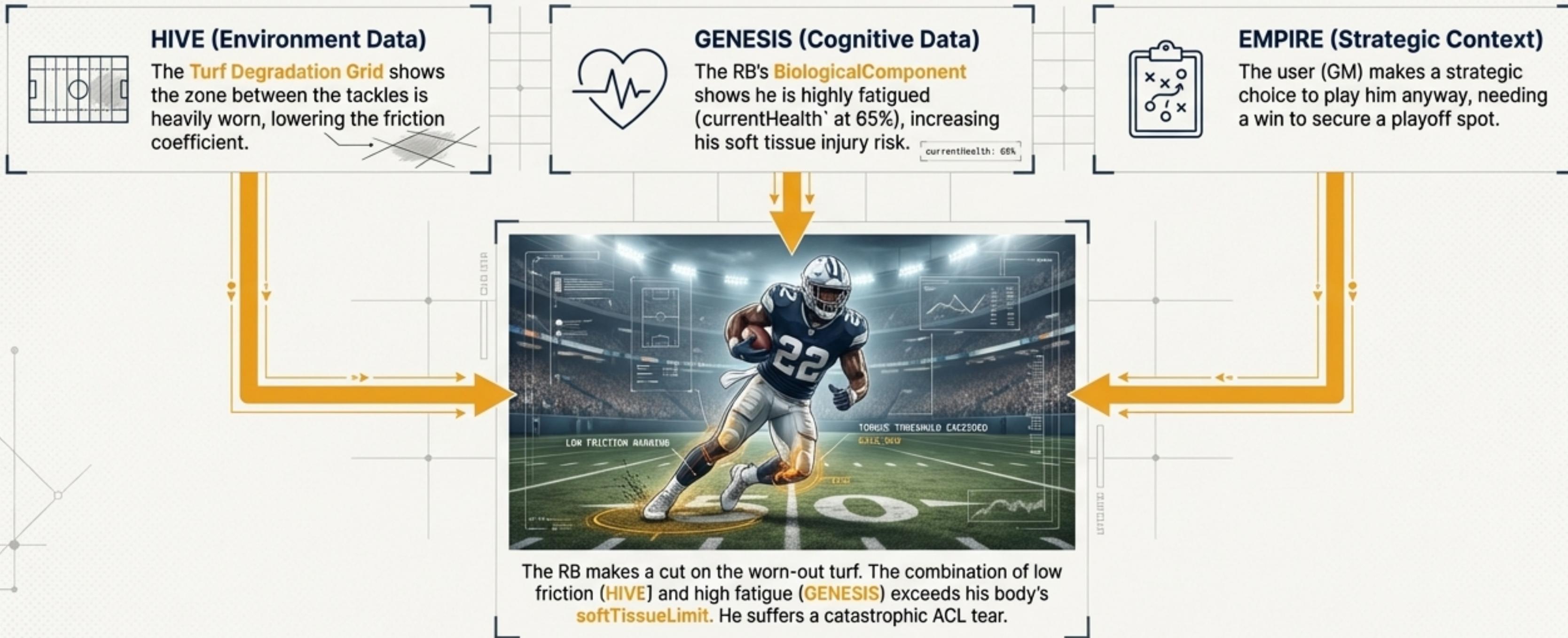
Measures QB accuracy against the difficulty of a throw, factoring in separation, pressure, and throw distance.

Quantifies lineman performance by measuring how often a pass rusher beats their block within a critical 2.5-second threshold.

These are not post-game stats; they are real-time outputs of the CORE loop, used to drive dynamic commentary, player progression, and AI decision-making.

# “The Emergent Narrative: When Every Decision Matters”

A star Running Back is playing in a critical late-season away game on a notoriously cheap turf field.



**“I shouldn't have played my star RB on that cheap turf field while he was fatigued.”**

This isn't a random event. It's a direct, logical consequence of interconnected systems and player choice.



# The Unscripted Future

## The Old Way



**We are replacing the brittle logic of the Animation Dictatorship with a robust, layered simulation. The goal is not to create a game with infinite pre-written stories, but an engine that allows infinite, authentic NFL stories to write themselves.**

# The Cortex Way

