



# CIPHER

*D E C O D E .   T R A N S M U T E .   O P T I M I Z E .*

---

## THE THESIS

We are asking the core question of the ENCODE challenge: *What happens when AI is the interface, not just a feature?*

Current health tech is passive—it acts as a database browser that dumps raw ingredient lists on the user. **CIPHER** is an active biological operating system. It moves beyond "Tracking" (What did I eat?) to "Reasoning" (How does this fuel *my* specific biology?).

---

# THE "BLACK BOX" OF NUTRITION

The modern food supply chain is optimized for regulatory compliance, not human understanding.

## Nutrition Facts

Serving Size 1 cup (228g)

Sodium 1600mg

## THE DATA GAP

A standard label lists "1600mg Sodium." To a database, this is just a number. To a human, it is meaningless without medical context.

## THE "ONE SIZE" FALLACY

Existing apps treat a hypertensive diabetic the same as a competitive powerlifter.

## THE FRICTION WALL

The cognitive load of reading labels and manually logging food is the #1 cause of user churn.

## WHY "SMART" APPS FAIL

Most "AI" nutrition apps are just wrappers around OCR (Scanning) technology.

### 1. Menu-Driven

They force users to navigate complex hierarchies.

### 2. Filter-First

They require users to manually set filters, assuming the user knows what they need.

### 3. Passive

They wait for input rather than anticipating outcomes.

"WE DON'T NEED MORE DATA ACCESS. WE NEED A **TRANSLATOR** THAT CONVERTS CHEMICAL COMPOSITION INTO BIOLOGICAL IMPACT."

# CIPHER

## v2.1 // Technical Report

### CORE STACK

- > Next.js 14 (App Router)
- > Groq Cloud (Llama-3)
- > Tailwind CSS v4

### ZERO-UI ANALYSIS

We eliminated forms. Input is handled via a single "Omni-Input" that accepts text, barcodes, or natural language.

### POLYMORPHIC INTERFACE

The UI is not static. It is a **Component Factory** that renders 10+ distinct UI types based on inferred user intent.

### CINEMATIC AUTOPILOT

A script-driven "Ghost Engine" simulates DOM interactions, eliminating video files.

## THE BIO-SYNC ENGINE

### USER PROFILE CONTEXT

```
{  
  "biometrics": "BMI/BMR (Dynamic)",  
  "conflict_guard": [  
    "Flag: Peanuts (Allergy)",  
    "Flag: High Sodium (BP)"  
  ],  
  "goal_alignment": "Muscle_Gain_v2"  
}
```

Products are scored not universally, but based on "Fit" for the user's specific goal.

## THE SIMULATION ENGINE

### "WHAT IF" RECIPE HACKING

#### Interactive Toggles

#### REAL-TIME RE-CALC

Drain Noodles



Double Protein



RESULTING SODIUM: 420MG (-60%)

# Polymorphic Component Factory

We do not stream text. We stream Visual Metaphors.

User Query → Intent Classifier → Select Component → Render React Node

components/generative/compliance\_matrix.t

**COMPLIANCE MATRIX**



Diet/Allergy safety checks visualization.

components/generative/battle\_card.tsx

**BATTLE CARD**



Split-screen head-to-head macro comparison.

components/generative/toxicity\_gauge.tsx

**TOXICITY GAUGE**



Visual risk assessment of specific additives.

**Key Innovation:** The AI determines the *best way* to visualize the data, giving us an "Infinite Interface."

# THE REASONING ENGINE

MODE: ACTIVE SIMULATION // CONTEXT: HYPERTENSION PROTOCOL

Target: Muscle Gain

● LIVE CONNECT

>> ANALYSIS LOG

## CRITICAL MISMATCH

Sodium load (1600mg) induces vasoconstriction. This conflicts with your pre-workout vasodilation target.

### AI\_REASONING\_CHAIN:

- > Detected: High Sodium with Hypertension History
- > Action: Suggest Modification

94  
OPTIMIZED

Remove Flavor Packet  
-800mg Sodium

Add Spinach  
+Nitrates (Flow)

>> BIO-METRICS

PROTEIN EFFICIENCY

85%

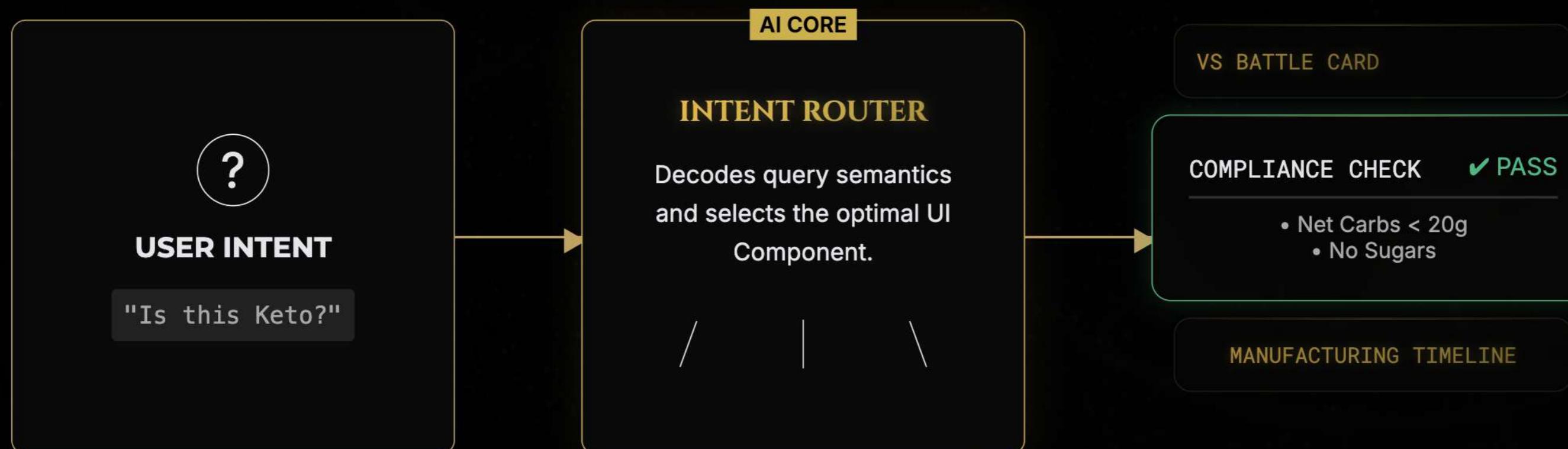
GLYCEMIC STABILITY

92%

MULTI-AXIS SCORE

# POLYMORPHIC GENERATIVE UI

The interface shapeshifts based on intent. We do not use static templates.



# THE "GHOST" AUTOPILOT

Solving the "Cold Start" problem via Cinematic Calibration.

T-MINUS 0:00

⚠ ERROR

?

SUBJECT UNIDENTIFIED

User searches without context. System rejects  
the query to prove that generic data is  
dangerous.

T-PLUS 0:15

★ AI TAKEOVER



> CALIBRATING\_PROFILE...  
> SET\_GOAL: HYPERTROPHY

"Ghost Engine" takes control of the cursor.  
Builds the Bio-Avatar automatically.

T-PLUS 0:45

✓ OPTIMIZED

94

MATCH CONFIRMED

Search re-runs automatically with new context.  
User sees the value of personalization instantly.

# THANK YOU



---

UNIT:  
HALLUCINATORS  
BITS PILANI

CIPHER // DECODE. TRANSMUTE. OPTIMIZE.