

# I Built an AI Running Coach

Adam Gordon Bell

Community Engineer

Pulumi

# Monsters of Mazinaw



# The Course



# The Rivalry



"Every year I do the race. Malcolm beats me."

"This year, I shall beat him."

# Monster of Mazinaw 10K — 2025

Place	Name	Time
1	Katie McParlan	53:34
2	Seamus Fraser	57:22
3	Julie Schneider	57:23
...		
12	Malcolm Clarke	1:05:29
25	Adam Bell	1:12:23

# Two Kinds of Running Plans



**COUCH TO 5K**  
TYPEONERUN.ORG/SK  
TYPE ONE RUN  
A PROGRAM OF BEYOND TYPE 1

WEEK	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1	strength workout lower body	walk 20 min	rest & stretch	run 5 min easy 5 min moderate	strength workout upper body	walk 5 min run 10 min (alternate 1 min run & 1 min walk) walk 5 min	rest & stretch
2	strength workout lower body	walk 30 min	rest & stretch	run 5 min slow 5 min moderate 5 min quick	strength workout upper body	walk 5 min run 10 min (alternate 1 min run & 1 min walk) walk 5 min	cross train bike or hike
3	strength workout lower body	walk 30 min	rest & stretch	run 20 min (increase effort every 5 min)	strength workout upper body	walk 5 min run 20 min (alternate 2 min run & 1 min walk) walk 5 min	cross train bike or hike
4	strength workout upper body	walk 30 min	rest & stretch	walk 5 min run 20 min (alternate 1 min run & 1 min walk) walk 5 min	strength workout lower body	walk 5 min run 20 min (alternate 2 min run & 1 min walk) walk 5 min	cross train bike or hike
5	strength workout upper body	walk 30 min	rest & stretch	run 20 min (increase effort every 5 min)	strength workout lower body	walk 5 min run 25 min (alternate 1 min run & 1 min walk) walk 5 min	cross train bike or hike
6	strength workout upper body	run 0.5 mi moderate 1.5 mi hard 0.5 mi walk	rest & stretch	walk 5 min run 20 min (alternate 1 min run & 1 min walk) walk 5 min	strength workout lower body	<b>RACE DAY</b>	rest & stretch

**Serious runners** — Garmin watch, Strava, know their goal marathon time, extensive training programs.

**"Get in shape" advice** — Couch to 5K, just get going.

# **The idea: I need momentum.**

- Consistency & Ongoing feedback.
- If I can just keep up my running volume year round I can beat Malcolm
- Lesson: Building personal software is now stupidly easy.

# Tha Vague Plan

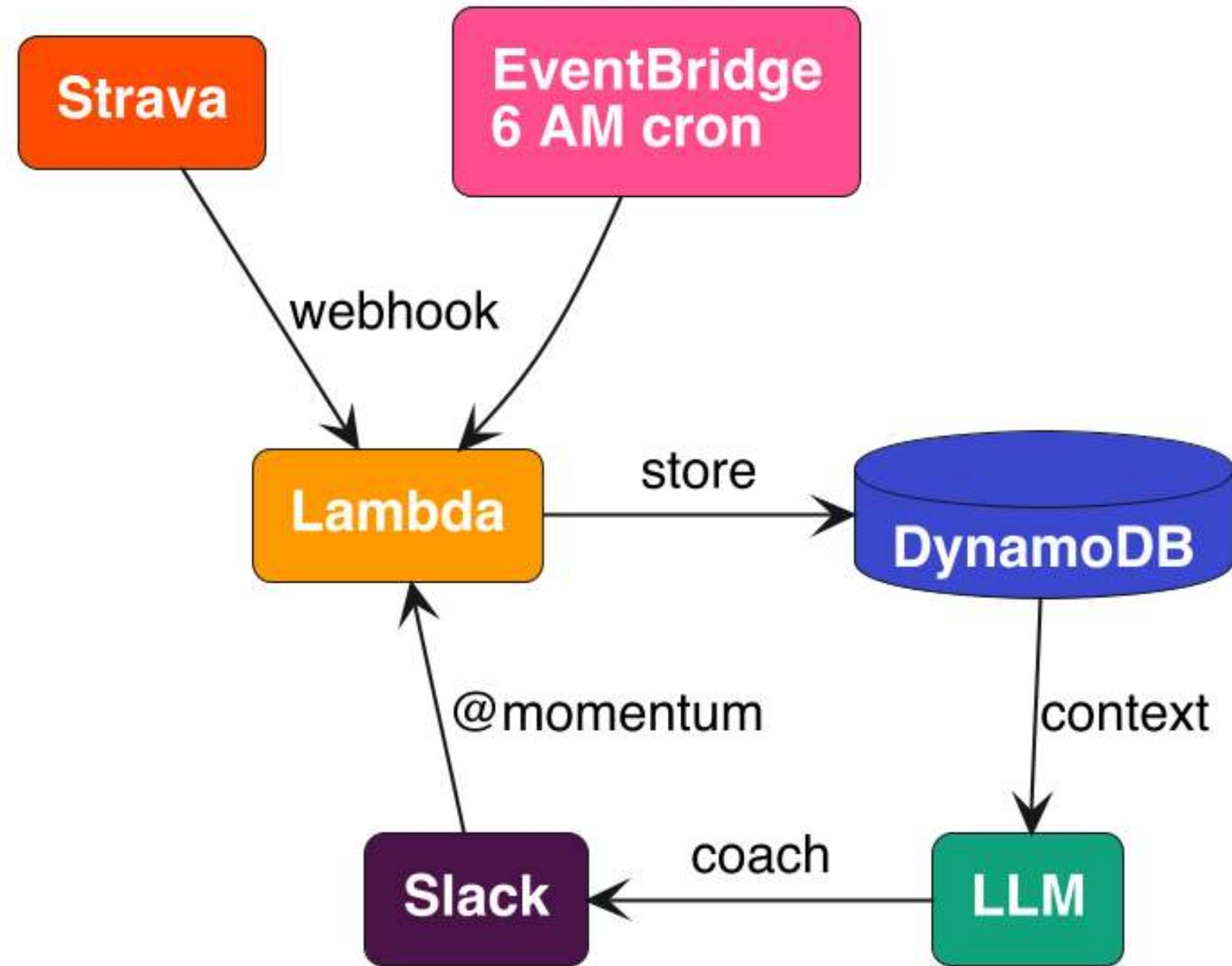
```
@every_morning(6, tz="America/Toronto")
def daily_checkin():
    week = get_training_plan()
    done = get_runs_this_week()
    remaining = week - done

    if today in remaining:
        slack("Hey, you've got a run today ...")

@on_strava_webhook("activity.created")
def post_run_review(activity):
    stats = get_activity_stats(activity)
    history = get_recent_runs()

    feedback = llm(
        system="You are my running coach.",
        context={"run": stats, "history": history}
    )
    slack(feedback)
```

# Architecture



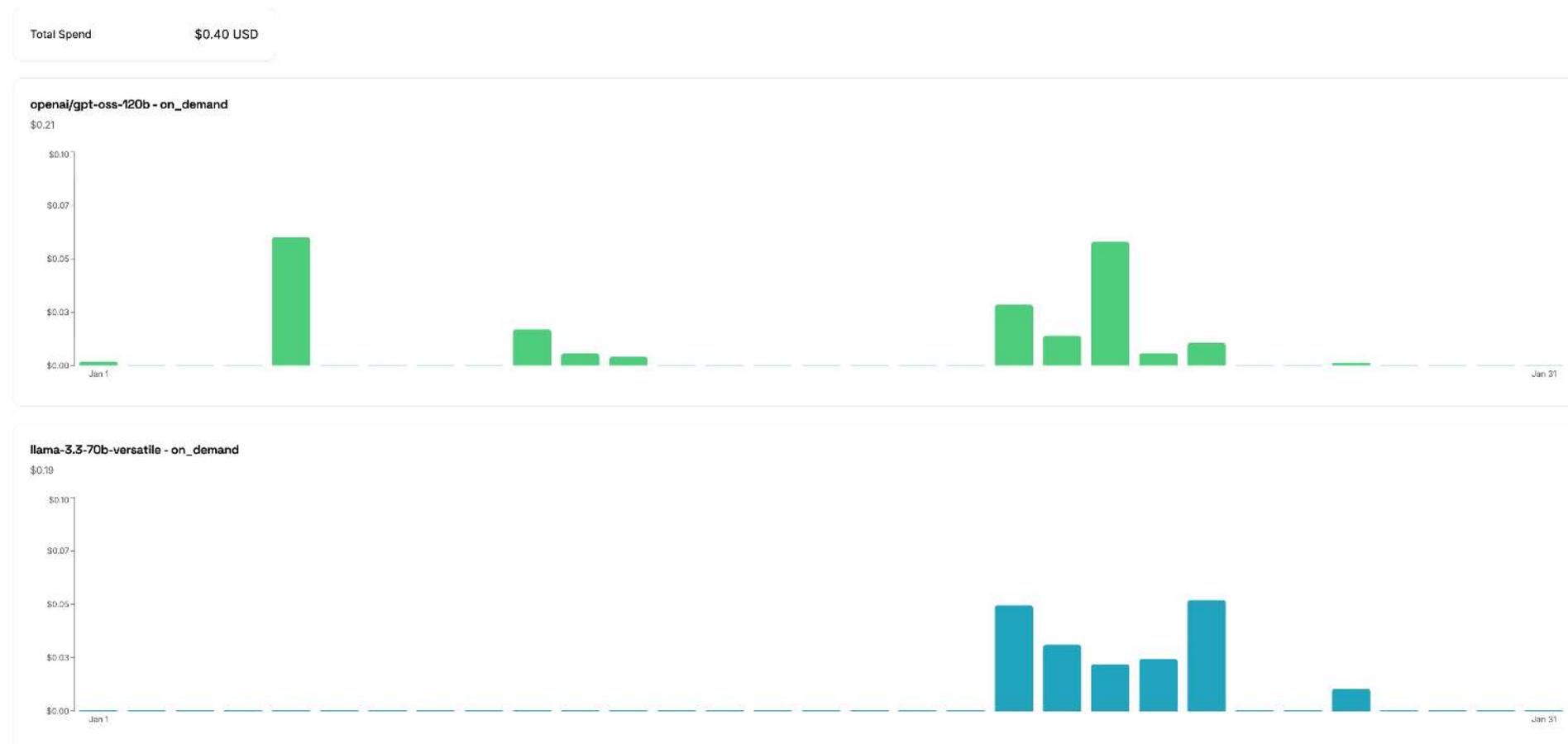
# The Infra

```
activities_table = aws.dynamodb.Table(  
    "momentum-activities",  
    billing_mode="PAY_PER_REQUEST",  
    hash_key="athlete_id",  
    range_key="start_date",  
)  
  
lambda_function = aws.lambda_.Function(  
    "momentum-app",  
    runtime="provided.al2023",  
    code=pulumi.FileArchive("../pythonapp.zip"),  
    timeout=900,  
)  
  
function_url = aws.lambda_.FunctionUrl(  
    "momentum-url",  
    function_name=lambda_function.name,  
    authorization_type="NONE",  
)
```

# The 6 AM Nag

```
daily_schedule = aws.scheduler.Schedule(  
    "daily-checkin",  
    schedule_expression="cron(0 6 * * ? *)",  
    schedule_expression_timezone="America/New_York",  
    target=aws.scheduler.ScheduleTargetArgs(  
        arn=lambda_function.arn,  
        role_arn=scheduler_role.arn,  
    ),  
)
```

# ~\$1/month



Scale to zero architecture

Lambda, DynamoDB have free tiers

S3 and event bridge cost almost nothing at this level

LLM inference is the expensive part and its less than cheap

# **Always On, Almost Free**

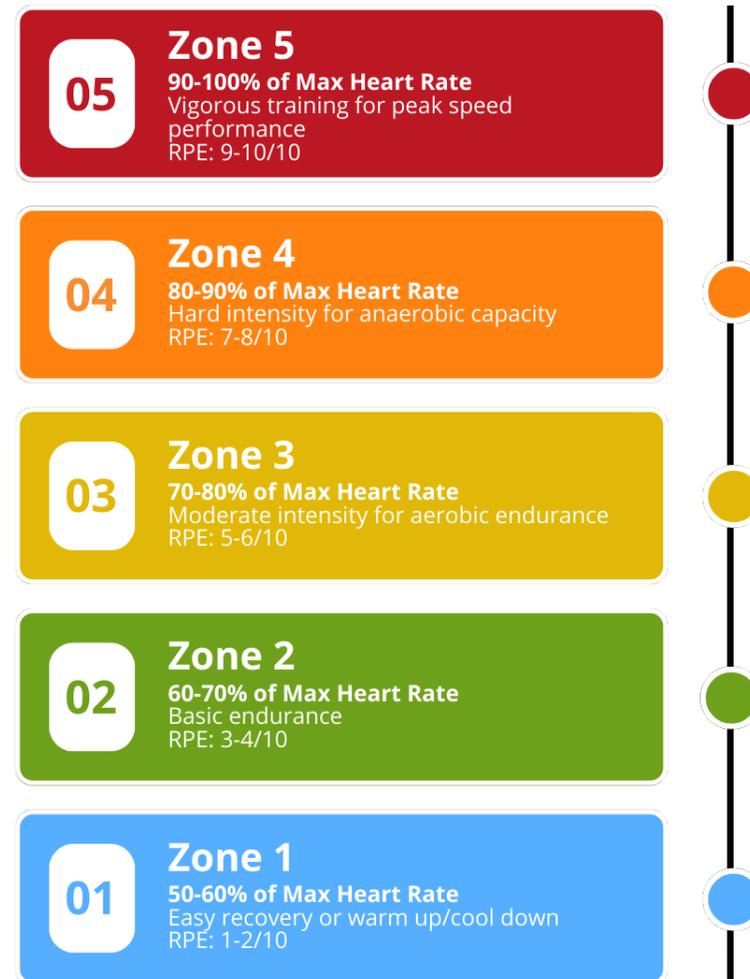
**AWS:** Lambda + DynamoDB + S3 + EventBridge

**GCP:** Cloud Run + Firestore + Cloud Storage

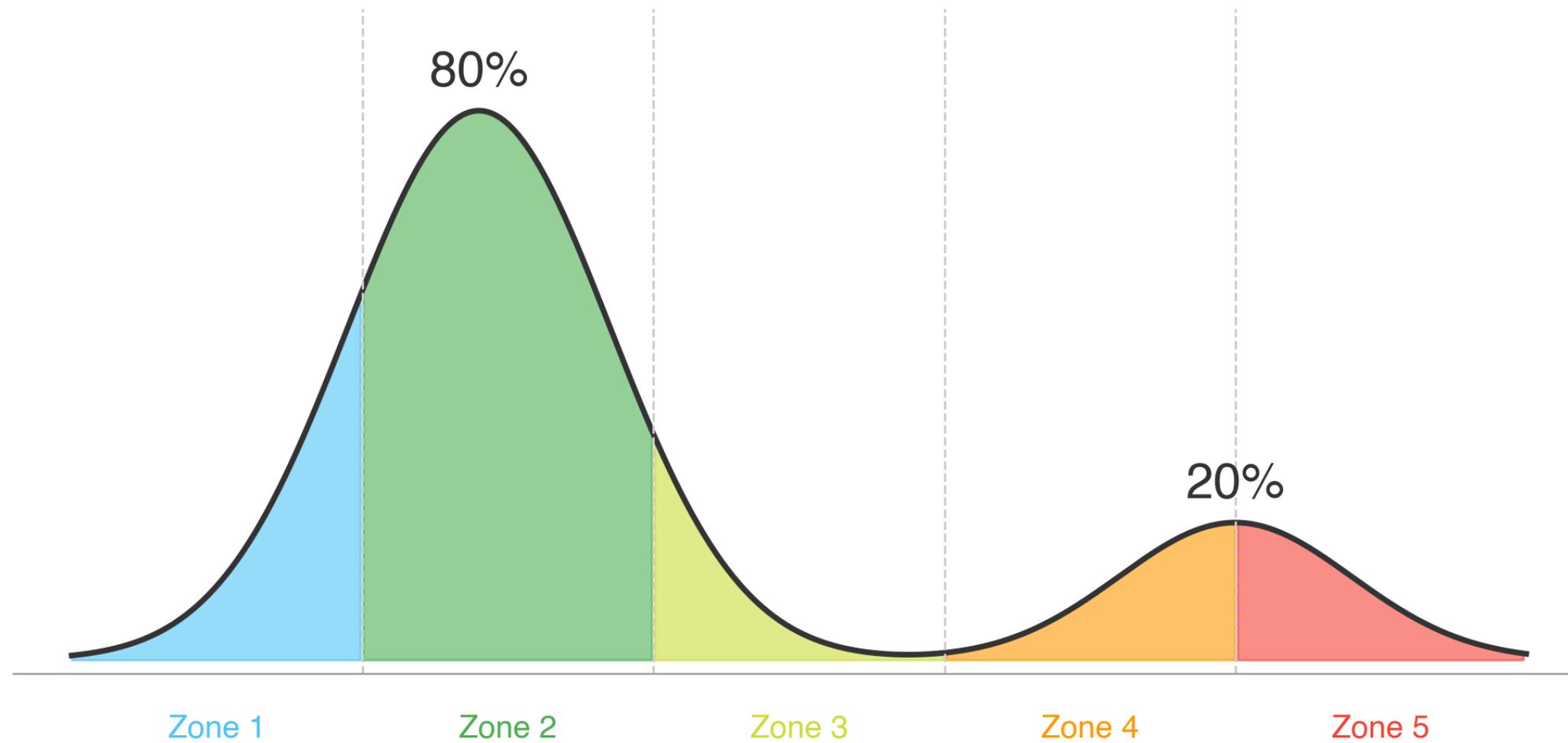
**Azure:** Functions + Table Storage + Blob Storage

**Cloudflare:** Workers + D1 + R2

# How to train?

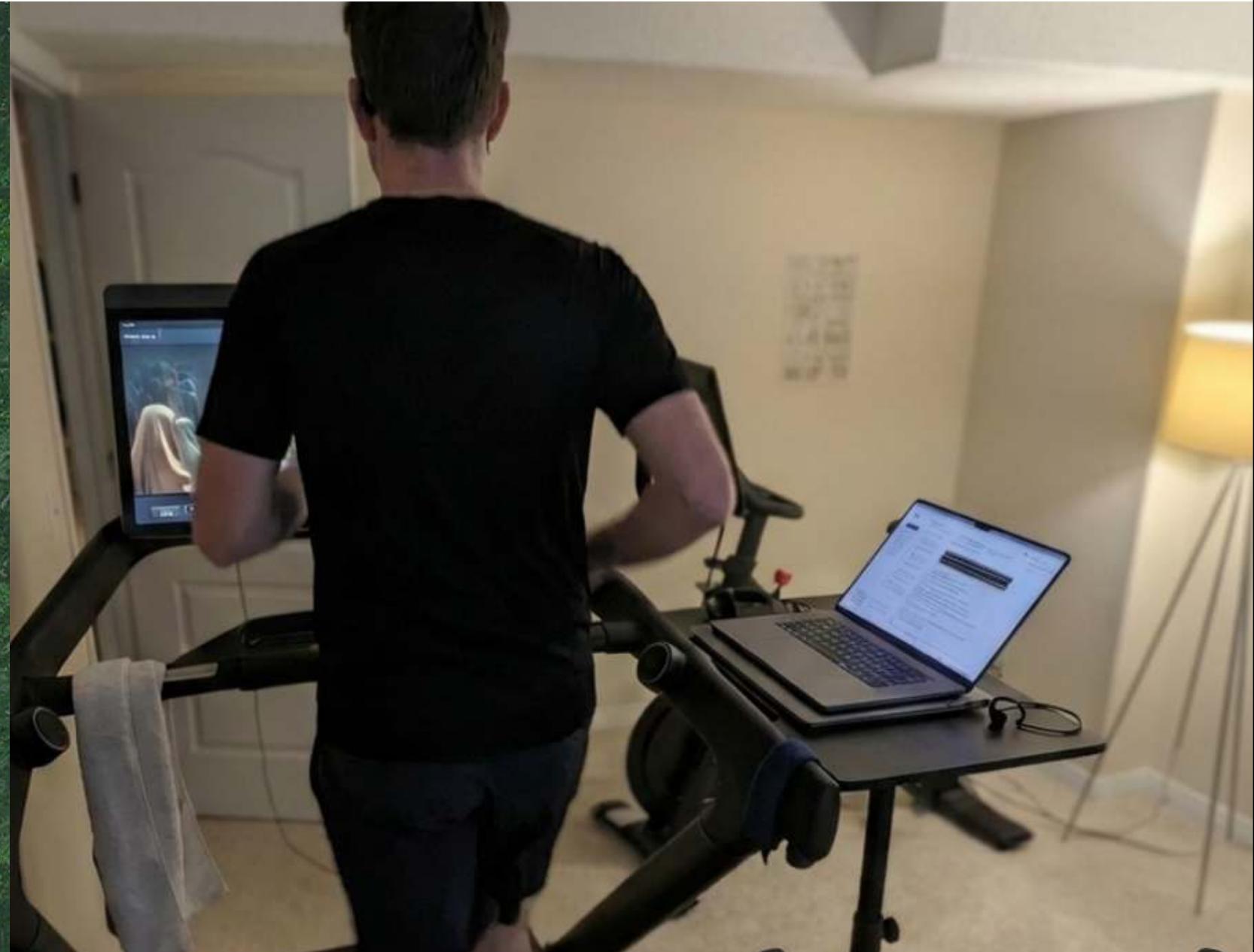


# The Polarized Training



80% Zone 2. 20% high intensity.  
Plus a long run + strength training.

# Data problem: Two Types of Runs



# Cognitive Delegation

Code does mechanics. The LLM does meaning.

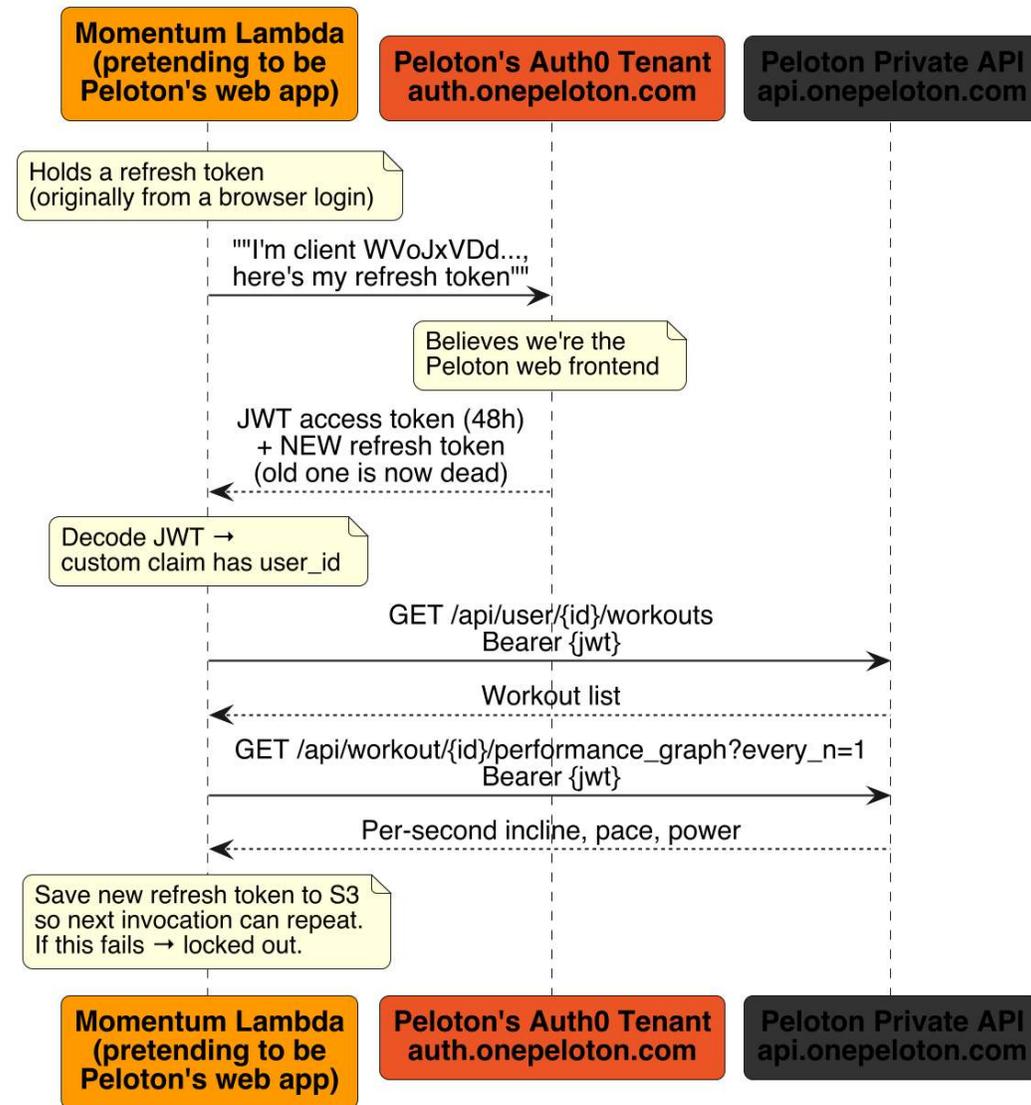
```
# ❌ Brittle
positive = ["great", "awesome", "good"]
if any(w in text for w in positive):
    sentiment = "positive"
# Misses: "I'm tired but good tired"

# ✅ Delegate to the model
sentiment = llm(
    "Classify this journal entry",
    text, model="haiku"
)
# Returns: "positive_tired"
```

**Peloton does not have an API.**

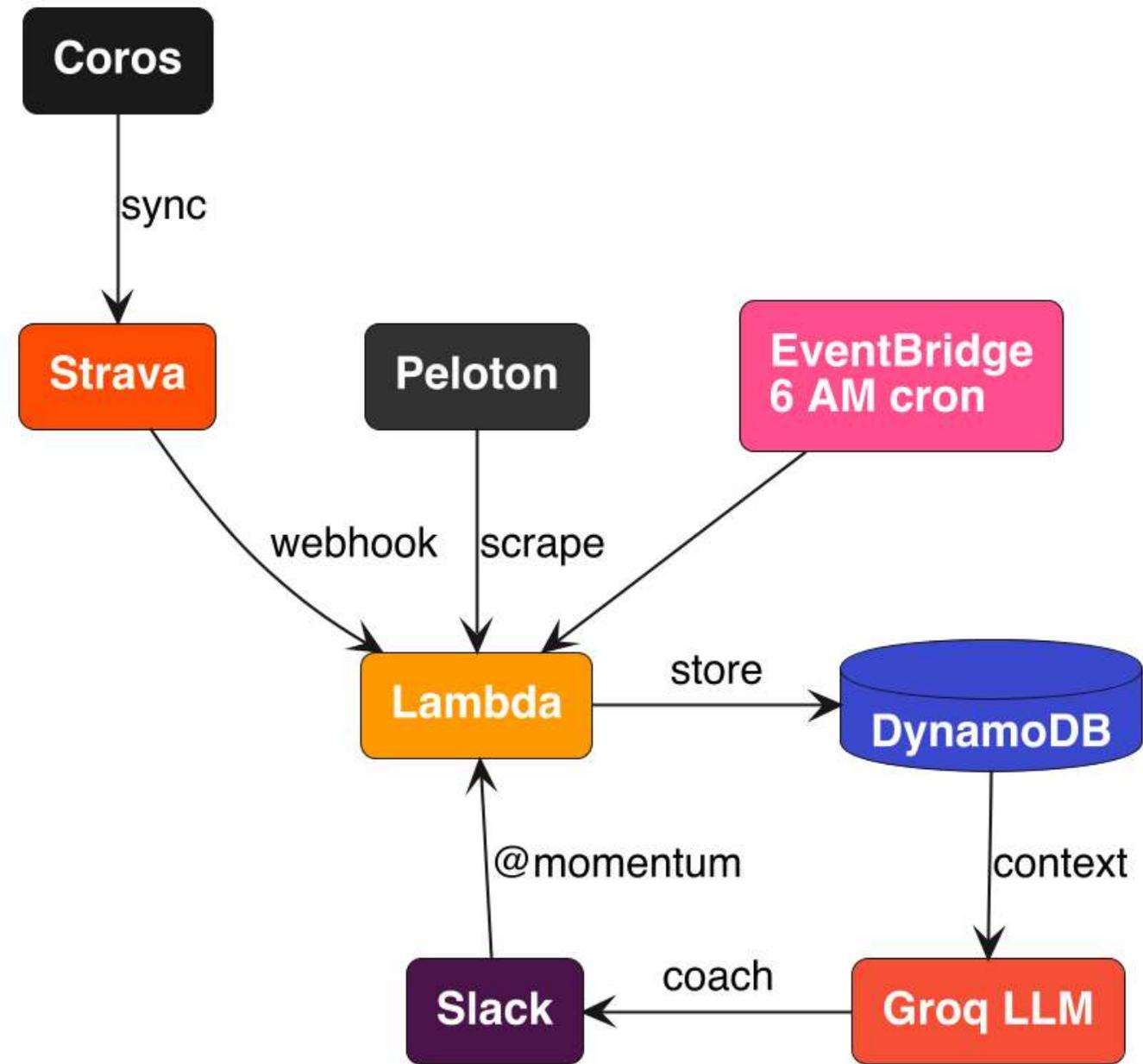
And they don't send all ( incline ) data to Strava

# Data Engineering: The Peloton Hack



```
> var key = "@auth0spa...s://api.onepeloton.com/:openid  
offline_access";  
var data = JSON.parse(localStorage.getItem(key) || "{}");  
var rt = data && data.body && data.body.refresh_token;  
if (rt) { console.log("REFRESH TOKEN:\n\n" + rt); } else { console.log("No refresh_token found.",  
Object.keys((data && data.body) || {})); }  
REFRESH TOKEN: VM281:4  
[REDACTED]
```

# Architecture



# The Run Stream

```
{
  "activity_id": "17321805264",
  "is_indoor": true,
  "sample_interval": 1,
  "heart_rate": [93, 93, 95, 97, ...],
  "speed":      [0.89, 0.89, 0.91, ...],
  "cadence":    [51, 51, 52, ...],
  "power":      [82, 82, 84, ...],
  "grade":      [2, 2, 2, ...],
  "source_ranges": [
    {"field": "heart_rate", "source": "coros"},
    {"field": "speed", "start": 0, "end": 7253, "source": "peloton"},
    {"field": "speed", "start": 7253, "end": 7278, "source": "coros"},
    {"field": "grade", "source": "peloton"},
    {"field": "power", "source": "peloton"}
  ]
}
```

# The Activity Record

```
{  
  "activity_id": 17321805264,  
  "activity_type": "Run",  
  "activity_subtype": "Indoor",  
  "distance_meters": 10713,  
  "moving_time_seconds": 7260,  
  "avg_hr": 137,  
  "zone1_seconds": 1206,  
  "zone2_seconds": 2580,  
  "zone3_seconds": 2978,  
  "zone4_seconds": 514,  
  "avg_incline": 7.96,  
  "gap_str": "11:19 min/km",  
  "efficiency_factor": 0.644,  
  "core_ef": 0.876,  
  "splits": [ ... 11 per-km splits ... ]  
}
```

# What the Coach Sees

## ## Current Week (Feb 2 – Feb 8)

Activities: 3 | Total Time: 4:15

Zone Breakdown: Z1: 45min, Z2: 1:30, Z3: 1:20, Z4: 20min

- Wed Feb 5 - 48min Run (outdoor, 85m elev)  
Z2: 30min, Z3: 13min - Core EF: 1.02
- Fri Feb 7 - 2:01 Run (treadmill)  
Z2: 43min, Z3: 50min - Core EF: 0.88
- Sat Feb 8 - 35min Strength

## ## Recent History (Last 3 Weeks)

Week of Jan 26 – Feb 1: 3:45, 4 activities

# The Training Plan (in the prompt)

Date: Tuesday, March 3

Phase: Winter Engine (Jan-Mar)

"Diesel building – treadmill long runs,  
mix 12% incline hiking with Z2."

Race: Monster of Mazinaw 30K Trail  
September 27 (208 days)

Macrocycle:

- ✓ Fall Reset (Oct-Dec) rebuild, 5h/week
- Winter Engine (Jan-Mar) treadmill LRs to 3h
- Spring Specificity (Apr-Jun) trails, hills
- Summer Sharpen (Jul-Aug) longer trails, tempo
- September Taper 60% volume

Minimum Viable Week:

3× 45-60min Z2 | 1× 90-120min Long Run | 1× Strength

Given the athlete's recent activity and this plan,  
write today's morning check-in.

# The Prompt

## In (activity context):

```
Activities: 3 | Total Time: 2:48h
- Mon - 48min Run - Core EF: 1.02
- Wed - 44min Run - Core EF: 0.99
- Fri - 49min Run - Core EF: 1.02
```

## Out (LLM generates):

```
Aerobic:  2:48h / 5:00h
```

```
|— ✓ Mon - 48min Run - EF: 1.02
|— ✓ Wed - 44min Run - EF: 0.99
|— ✓ Fri - 49min Run ← just now
|— ○ Sat - Long Run (90min)
|— ○ Sun - Strength (60min)
```

```
MVW: 3 runs ✓✓✓ | Long Run ○ | Strength ○
```

```
Third Z2 this week, steady and controlled.
What made starting easiest today?
```

# Post-Run Feedback

 **Momentum** APP Feb 19th at 6:31 AM  
**Evening Run Review**

1 reply

 **Momentum** APP Feb 19th at 6:31 AM  
**Latest Activity: Evening Run**

[i qp2upoi](#) Evening Run (treadmill)

Distance: 4.40 km · Duration: 46 minutes · Pace: 9:58 min/km (GAP: 10:36 min/km) ·

Grade: 8.5%

Core EF: 0.98 (42 min steady-state)

HR Zones: Z1: 4min, Z2: 31min, Z3: 11min

### Week of Feb 16-22

Aerobic:  1:58h / 5:00h

└— ✓ Mon - 1:12 Run - EF: 1.01 ([zdu3g6u4](#))

└— — Tue

└— ✓ Wed - 46min Run - EF: 0.98 ([i qp2upoi](#)) ← just now

└— ○ Thu - Strength (60min)

└— — Fri

└— ○ Sat - Long Run (1:45-2:00)

└— ○ Sun - 45min Z2 Run

MVW: 3 runs ✓✓○ | Long Run ○ | Strength ○

Great work—46 minutes with 31 in Z2 at ~8-12% incline is perfect Winter Engine “diesel” building. This added +5.2 to fitness with modest fatigue (+2.9), and momentum is up vs last week—nice.

Which watch are you queuing next—finish Dune 2 or Dirk Gently?

# The Daily Check-In

 **Momentum** APP Sunday at 6:01 AM  
Sunday, February 22, 2026 Check-in

1 reply

 **Momentum** APP Sunday at 6:01 AM  
· @Momentum plan

## Week of Feb 16-22

Aerobic:  3:30h / 5:00h

└─ ✓ Mon - 1:12 Run - EF: 1.01 ( [zdu3g6u4](#) )

└─ Tue

└─ ✓ Wed - 46min Run - EF: 0.98 ( [iqp2upoi](#) )

└─ Thu

└─ Fri

└─ ✓ Sat - 1:32 Long Run - EF: 0.62 ( [slou3xzo](#) ) [LONG RUN]

└─ ○ Sun - Strength (60min)

MVW: 3 runs ✓✓✓ | Long Run ✓ | Strength ○

Fitness: ↑ +5% (30d) | Durability:  building

Great work—long run banked and this week's volume is up from last week. Anchor today with a 60-min Andy Speer strength session, RPE 6–7, and bias upper-body/core to spare the legs after yesterday. Bookmark the class now and set the mat/dumbbells out after lunch; if energy dips, 10 minutes of core + couch stretch still counts. Winter Engine focus: today's strength builds the hip/ankle stability you'll want on Mazinaw's technical trails. Weight at 168.4 yesterday—nice and steady; grab a carb plus 25–30 g protein after the session to recover well.

[See less](#)

 Plan

 Review

 Weekly

# Monday: The Plan



**Momentum** APP Feb 23rd at 6:02 AM

• @Momentum plan

## Week of Feb 23-Mar 1

Aerobic:  0:00h / 5:00h

└— ○ Mon - 45min Z1-Z2 Run

└— ○ Tue - Strength (60min)

└— — Wed

└— ○ Thu - 45min Z1-Z2 Run (continuous)

└— ○ Fri - 30min Z1 Lunch Run (optional)

└— ○ Sat - Long Run (120min)

└— ○ Sun - 60min Recovery Run

MVW: 3 runs ○○○ | Long Run ○ | Strength ○

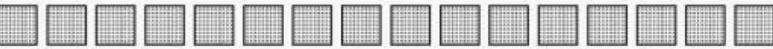
Fitness:  +3% (30d) | Durability:  building

# Tuesday: Already Reshuffling

 **Momentum** APP Feb 24th at 6:02 AM

• @Momentum plan

**Week of Feb 23-Mar 1**

Aerobic:  0:00h / 5:00h

┆— — Mon  
┆— ○ Tue - 45min Z1-Z2 Run  
┆— ○ Wed - Strength (60min)  
┆— — Thu  
┆— — Fri  
┆— ○ Sat - Long Run (105min)  
┆— — Sun

MVW: 3 runs ○○○ | Long Run ○ | Strength ○  
Fitness:  +3% (30d) | Durability:  building

# Wednesday: Different Conversation



**Momentum** APP Wednesday at 6:02 AM

• @Momentum plan

⚠ Last run: 3 days ago

This week: 3/7 ●○○●○○○

Mon/Tue were quiet—anything unusual this week, or just the usual work crush?

What's the easiest window today for 15–20 minutes—queue Stranger Things S5 so it's a no-brainer to start.



# Prompt: When Things Aren't Going Well

fragile (2-4 missed days):

TONE: Like a coach texting a friend.

Direct, warm, curious. Not a report.

Skip the weekly visual. 2-3 sentences max.

NO: progress bars, celebration preambles,  
prescribed times, looking back.

YES: Name the gap. Ask an open question.

low (5+ missed days):

Start with Motivation Prime

(non-physical: pick treadmill shows,  
text a friend, build a route list).

Rebuild the pull before asking  
for a workout.

# The Secret Ingredient: Intention stacking

Combine something you want to do with something you need to do.

I like making software.

Building the coach kept me running.

I was always tweaking prompts, wanting to see what it says next — so I kept running to feed it data.

# Chats for self correction

Some Sunday:

Momentum (after 90min run):

Solid 90-minute treadmill session – longest run yet.

Momentum (after 60 min strength):

A 60-minute strength class after a 90-minute run earlier today is ambitious. That's real commitment to the plan.

Adam 🗣️ (dictated note, 9:48 PM):

"I just finished my 60 min strength class and it was hard. I was going to pass out several times. Lots of squats and lunges."

Adam 🗣️ (dictated note, Next day):

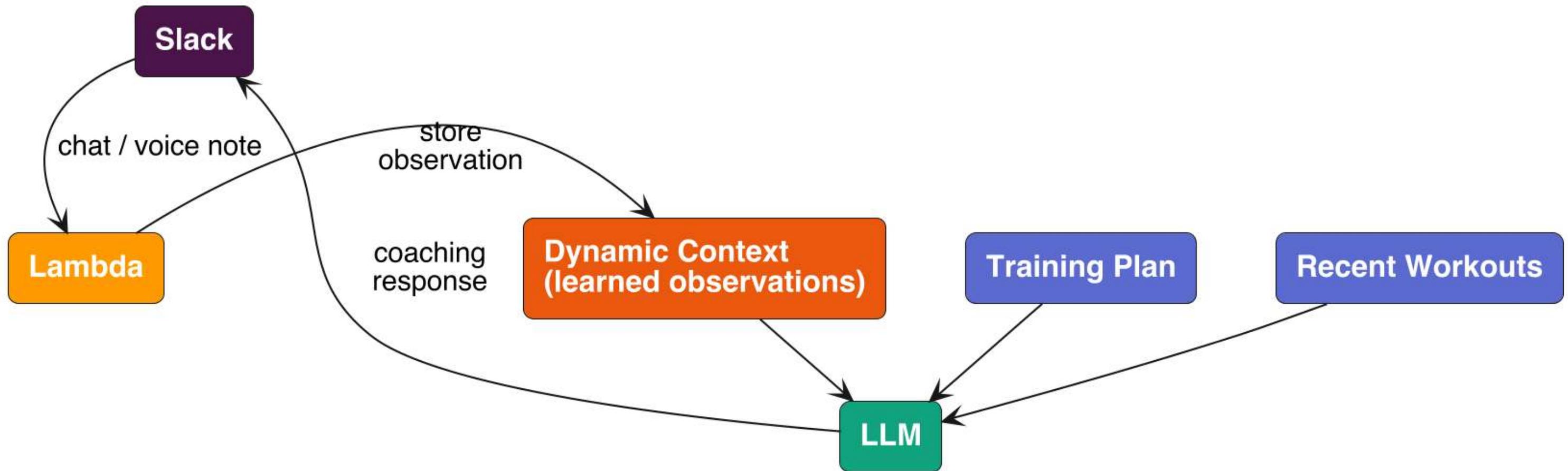
"Trouble walking from DOMS. Barely get down stairs"

Momentum (store):

## Discoveries & Experiments

- Strength + LR on the same day caused multi-day quad DOMS;
- separate by at least one day when possible

# Memory Without RAG



# Intent-Guided Prompting

## Not Rules

Respond in 2 sentences or less.

Always celebrate completed workouts.

Express concern if behind schedule.

Don't ask questions unless 3+ missed days.

If user mentions injury, switch to recovery mode .

If user mentions pain, recommend rest.

## But Principles

Be concise, encouraging, and honest.

When uncertain, ask one focused question.

# Intent-Guided Prompting

## Not Rules

If 3+ missed days, express concern.

If on track, show weekly progress.

If behind, suggest a catch-up workout.

Match tone to athlete motivation state.

Skip progress bar when athlete is fragile.

Keep it to 2-3 sentences when off track.

## But Examples

### Thriving:

Five consistent Z2 runs **is** solid.  
Saturday's planned long run anchors endurance.

### Fragile:

No runs **since** Sunday, Adam.  
Anything going **on**?

# The Actual Prompt

You are an encouraging, phase-aware running coach.

## PRINCIPLES:

Be concise, encouraging, and honest.  
Celebrate before you nudge. No shame.  
When uncertain, ask one focused question.  
Prefer easy-to-start actions over perfect plans.

## EXAMPLES:

Thriving (on track, 5 runs this week):

Five consistent Z2 runs. Great job.  
Are you ready for the long run?

Fragile (3+ missed days):

No runs since Sunday, Adam.  
Anything going on?

Low (5+ missed days):

Hey, let's choose a new show to watch  
on the treadmill during our next run.

# Function Calling as Intent

"did 60 min strength, totally gassed"

→ log\_activity(duration=60, intensity=hard)

"60 minutes is a long time for strength"

→ save\_reflection (opinion, not completion)

"That run felt harder than expected"

+ run in context → save\_activity\_note

+ no run yet → save\_reflection

"Legs are tired. Should I rest?"

→ save\_reflection + coaching\_question

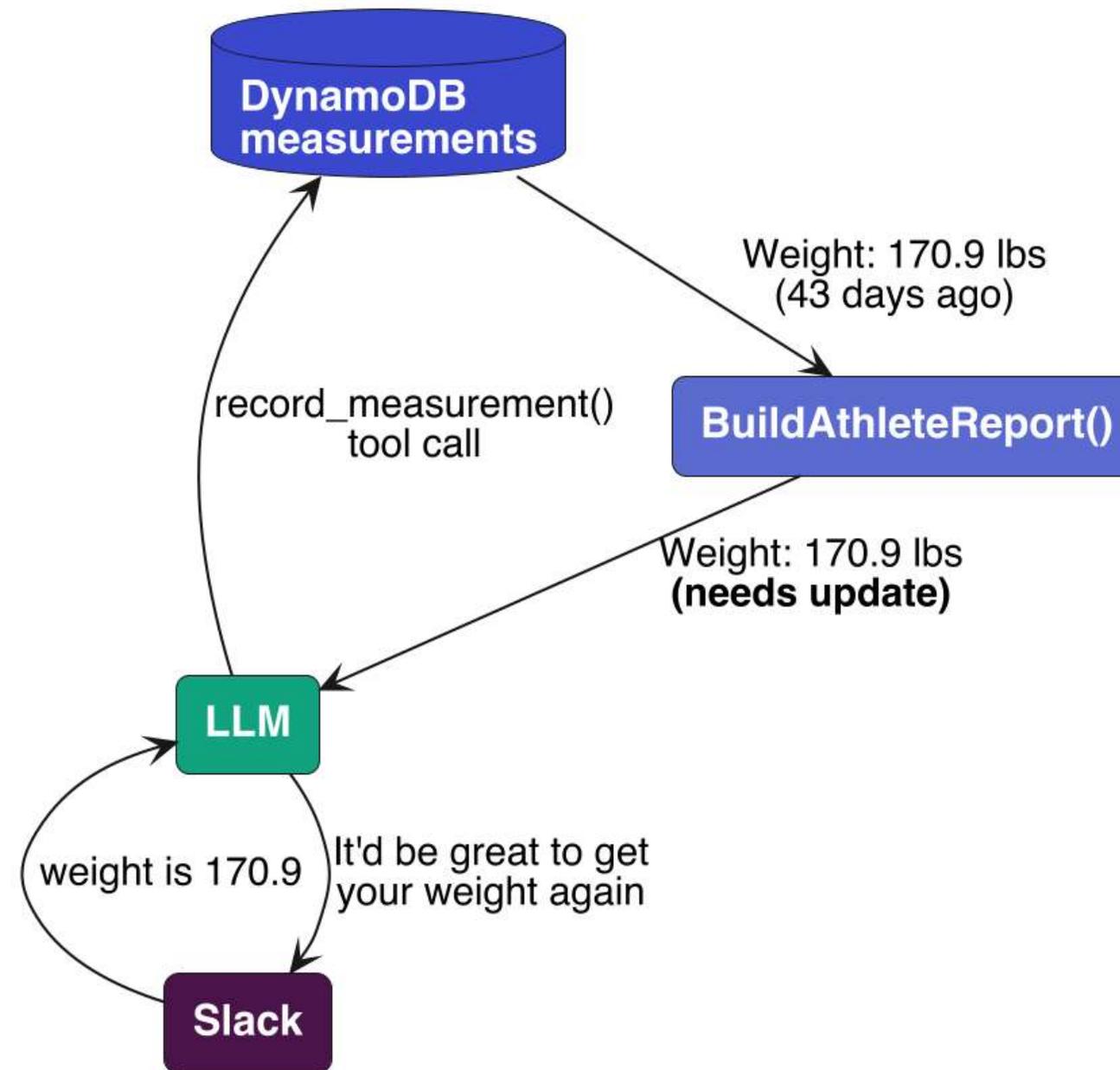
# The Demogorgon

"Today I didn't want to run, but once I got going, I kept going. Part of it was Stranger Things on the treadmill."

Next day, the coach says:

*"Today, after work, jump on a the treadmill and keep watching Stranger Things."*

# Health Tracking: Prompt driven



# **The Problem: Slack Gives You 3 Seconds**

Slack webhook requires a response in 3 seconds.

LLM inference takes 10–30 seconds.

So... how do you respond?

# Lambda Invokes Itself

```
# Step 1: Post "Thinking..." to Slack (< 3 sec)
# Step 2: Invoke yourself async
# Step 3: Second invocation calls LLM,
#         updates the "Thinking..." message
lambda_invoke_policy = aws.iam.RolePolicy(
    "self-invoke",
    role=lambda_role.id,
    policy=json.dumps({
        "Action": "lambda:InvokeFunction",
        "Resource": lambda_function.arn,
    }),
)
```

# Why Open Weight? Why Groq?

GPT OSS 120B on Groq. 128K context window.

~500 tokens/sec vs ~50-100 on OpenAI.

For a Slack bot, latency beats capability.

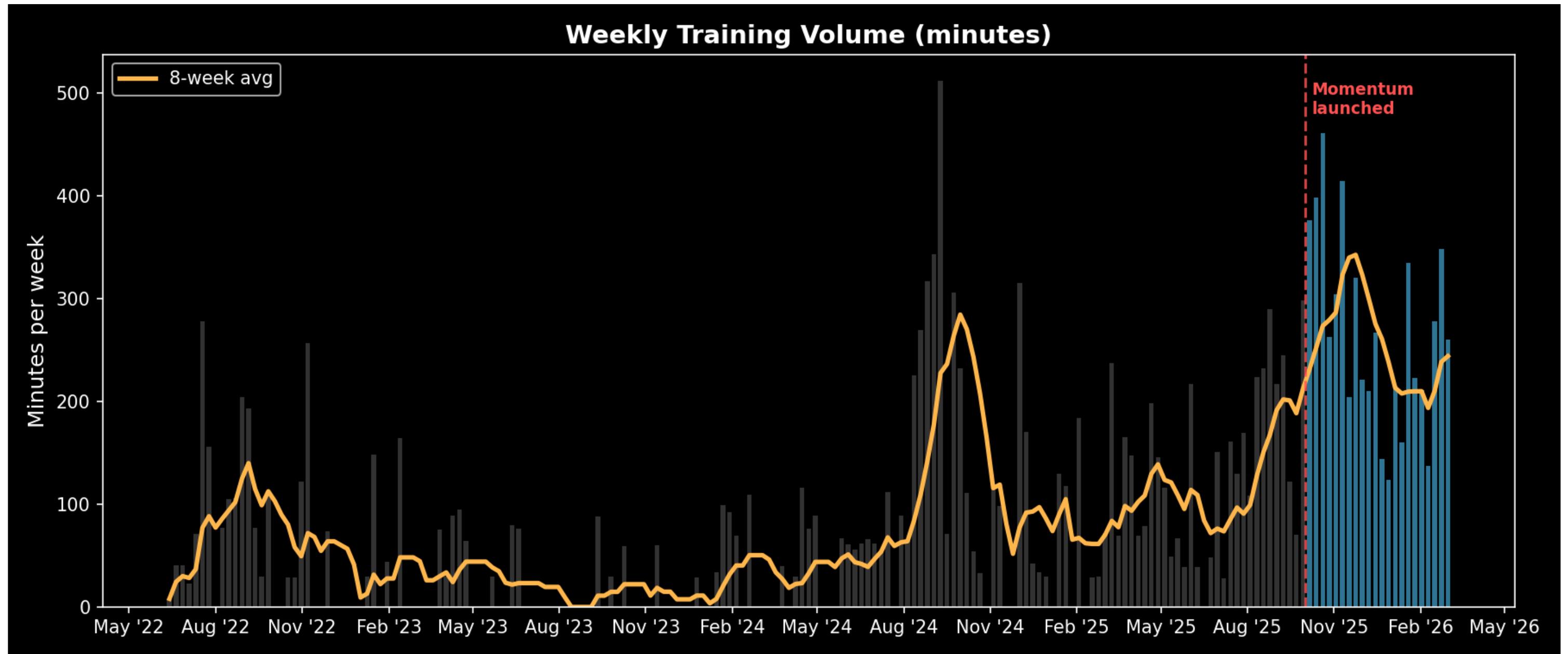
# Other things

- Performance - Am I getting faster?
  - A lot harder to determine
- Incorporating calendar / work schedule
- So many other little features

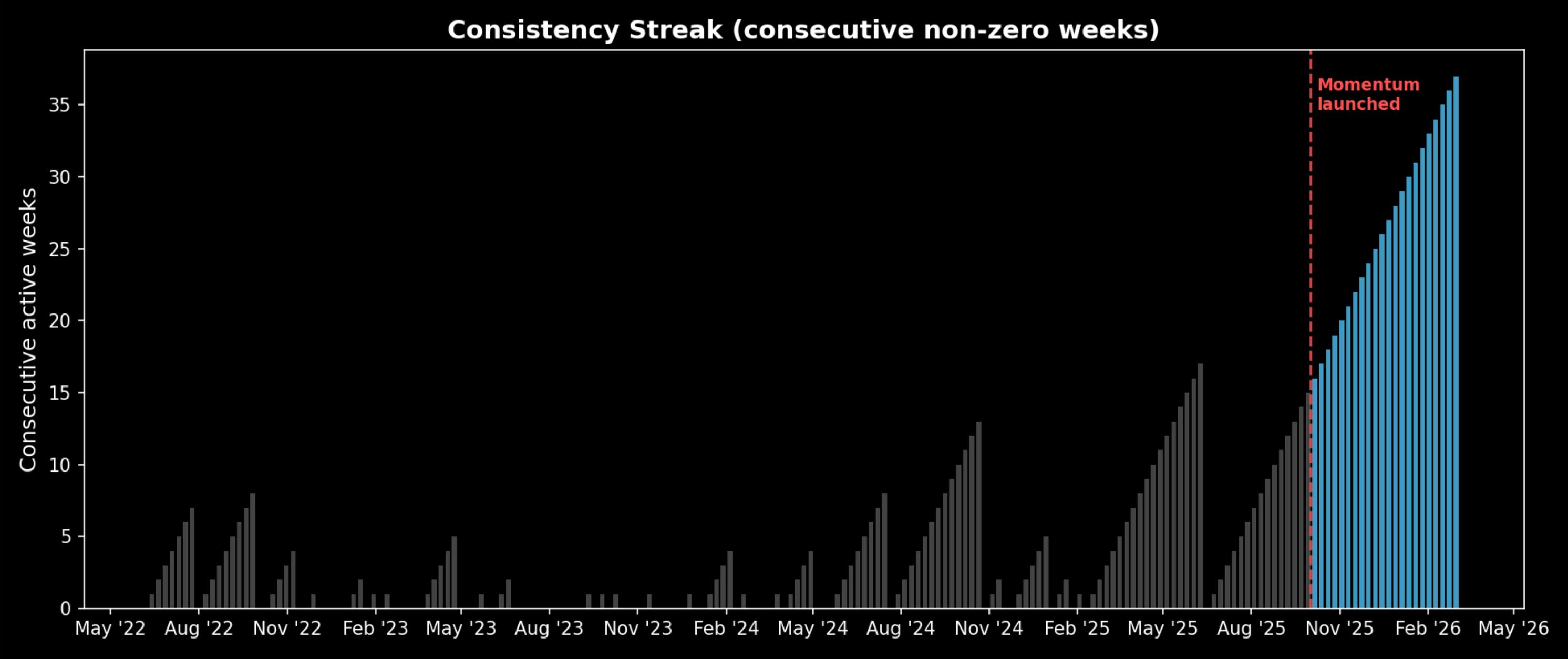
# Demo

Live: the Slack bot in action.

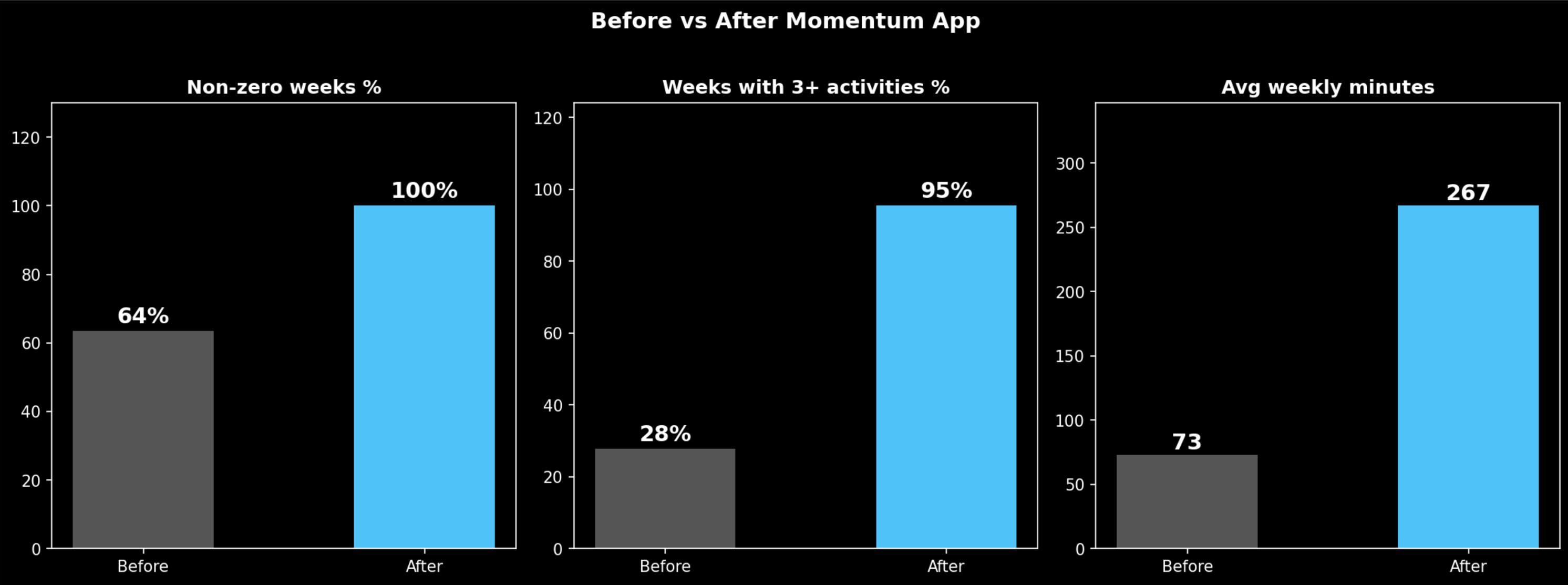
# Did It Work? Volume



# Did It Work? Consistency



# Did It Work? Before & After



# Personal vs Personalized

Netflix is *personalized*. This is *personal*.

No app will ever say: "go watch Stranger Things on your treadmill."

It learned from my words not to stack strength + long runs.

My motivations. My injuries. My TV habits.

# The Pattern

Your data + LLM + feedback loop.

It's not a chatbot — it consumes data I'm already producing.

The stack doesn't matter. \$1/month.

# What Would You Build?

Meal planning. Music practice. Sleep. Journaling.

Oura ring has an API. Your phone has sensors. Your apps have data.

The quantified self movement finally has a brain.

The barrier is gone: open models, coding agents, \$1/month.

"What do you wish someone was paying attention to in your life?"

# Beat Malcolm?

Monster of Mazinaw — Saturday, September 19th

"Canada's Shortest Ultramarathon (43 km) — but it will feel a lot longer."

Come run it with me.

# Thank You



Adam Gordon Bell — Pulumi

Come talk to me about personal AI, running, or Malcolm.

