EXECUTIVE ARCHITECTURE CASE STUDY

3PM DAILY: Simplifying High-Density Financial Market Intelligence

Architecting a high-throughput, low-latency market terminal compressing 800+ equities and multi-agent investment debates into an intent-driven workspace.

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The 6-Phase Product Design & Engineering Arc

STAGE 01

The 120-Min Window

Uncovering the post-market settlement gap between 1:00 PM and 3:00 PM PST.

STAGE 02

5 Archetypes & Zero Fiction

Segmenting attention and eradicating synthetic data with live exchange tape.

STAGE 03

Scrape → Math → Filter

Evaluating 827 tickers via TA-Lib in 4.2s and filtering via 9 LangGraph personas.

STAGE 04

The Golden 8 Cockpits

Organizing widgets into an 8/4 grid with an automated Lifecycle state machine.

STAGE 05

Production Defect Overhaul

Eliminating React 19 render storms, WCAG AA contrast bleed, and 0.00 CLS.

STAGE 06

>94% SaaS Gross Margins

Operating a WSJ-caliber terminal with a $100k paper trading PLG funnel.

Architecture Standard `Deterministic C-Math + Autonomous Multi-Agent Swarm + Intent-Driven UI`

Bridging the 120-Minute Post-Market Information Asymmetry

1. Retail traders log off after 1:00 PM PST; institutional desks spend 120 minutes settling closing cross auctions and after-hours earnings.
2. Independent operators face acute cognitive exhaustion, drowning in disjointed 4,000-word articles obscuring actual order flow.
3. Legacy terminals like Bloomberg and FactSet cost $24,000/year, establishing prohibitive economic barriers for independent funds.

TEMPORAL WINDOW

120 Minutes

1:00 PM – 3:00 PM PST settlement gap

LEGACY TERMINAL COST

$24,000 / Year

Prohibitive per-seat enterprise pricing

DELIVERY TARGET

3:00 PM PST Daily Brief Ship

5 Market Archetypes & Eradicating Synthetic Data Fiction

5 MIN

Briefing Reader

Macro narrative + 3 takeaways; zero chart clutter.

15 MIN

Tactical Trader

Demands 1× ATR stops, targets, and paper execution.

10 MIN

Sector Allocator

Full-screen D3 treemap to track sector dispersion.

20 MIN

Catalyst Analyst

Earnings countdown and 9-investor Bull/Bear debate.

30 MIN

Solopreneur Operator

Automated agents & CMS for 1-click syndication.

GROUNDED RECORDS

3,944 Real Reports

COMPANY DOSSIERS

240 Industry Leaders

DAILY CONFLUENCE

98 Live Trades

Compiled Math Guardrails & 9-Persona LangGraph Swarm

STEP 01

Scrape the Tape

Finnhub & SEC Form 4 ingest prices, insider buys, earnings (3,977/day).

STEP 02

Compiled C-Math

Vectorized TA-Lib computes MACD, Bollinger Bands, S/R stops in 4.2s.

STEP 03

9-Persona Swarm

Buffett vs. Wood clash on +4 hurdle; Master Trader sizes ATR positions.

STEP 04

Reverse Tunnel

SSH tunnel bridges local MySQL to Cloud Run & Redis cache for sub-40ms.

TA-LIB SPEED	LANGGRAPH SWARM	CLOUD OPEX
4.2s (827 Tickers)	9 Personas in 18.2s	< $18 / Month

The Golden 8 Widgets & Intent-Driven Generative UI

8-Column Left vs. 4-Column Right Sidebar

- Left 8-Col: Lead Dispatch, D3 Treemap, Confluence Blotter.
- Right 4-Col: Movers & Decliners, Earnings Radar, War Room.
- Baselines balanced to 10px, eliminating 600px layout collapse.

OPPORTUNITY LIFECYCLE BEACONS

ACTIVE SETUP

Price inside accumulation zone

TARGET 1 HIT

Crossed 1:2 risk/reward target

STOP LOSS

Breached 1× ATR risk boundary

EXPIRED

Published >7 trading days ago

Testing in Production: Real Defects Eliminated

```
// Production Telemetry Status

{
   "ttfb_ms": 192,
   "cumulative_layout_shift": 0.00,
   "ta_lib_scan_duration_s": 4.2,
   "tunnel_daemon_uptime": "100% (self-healing)"
 }
```

FIX 1 // REACT 19 RENDER STORM

Decoupled client-side effect loops to eliminate infinite API query cascades.

FIX 2 // D3 PASTEL BLEED

switch isTextCanvas() dynamically to #0F172A on light tiles.

TTFB: 192ms (Turbopack)

CLS: 0.00 Across Views

Contrast: WCAG AA Compliant

>94% Gross Margins & The Solopreneur Paradigm

LEGACY MODEL

$24,000 / Year

Massive hardware lock-in and proprietary keyboards per seat.

3PM DAILY MODEL

$29 / Mo (>94% Margin)

Serverless Cloud Run + local C-math keeps hosting under $18/month.

PLG FUNNEL

$100k Sandbox

Browser localStorage syncs to Firestore on account creation.

GROSS MARGINS	OPEX	DAILY TIME
> 94%	< $18 / Month	< 30 Minutes

Transferrable Systems Engineering for Business Operations

01 // PIPELINES

High-Throughput

Orchestrating MySQL & C-bindings (827 equities in 4.2s) without synthetic data.

02 // LLMOPS

LangGraph DAG

Separating math from LLM debate; 101 assertions passing in 170ms in CI/CD.

03 // CLOUD OPEX

Serverless Scale

Architecting ~ $18/mo Cloud Run & Redis caching to eliminate runaway tokens.

04 // COHERENCE

Enterprise SQL

Proven high-throughput math, GraphRAG, and AST-guarded NL-to-SQL.