ANANTHA PADMANABHAN

Capital Markets Risk Technology Leader | Founder, Capital Markets AI

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SUMMARY

Strategic technical leader with 20+ years bridging capital markets risk technology and frontier AI. Currently founder of Capital Markets AI, where I publish original research on fractal risk intelligence and build production AI systems on the Anthropic Claude API. Prior 13 years at Calypso as Global Head of Technology Presales ($50M ARR, 10 SAs across NA/EMEA/APAC) and 6 years at EZOPS as Director — building cloud-native AI reconciliation, scaling a 25-member engineering team, attaining ISO-27001 in 3 months. Active builder with two SSRN working papers on AI in capital markets risk and a Treasury PoC pairing Mandelbrot's MMAR with LLM regime signals.

KEY ACHIEVEMENTS

Revenue Growth: Achieved $50M ARR in 3 years | **Process Improvement:** Led projects reducing deployment time by 25% | **Team Building:** Built 25-member engineering team in Chennai; 10-member product team for EZOPS Data Modeler | **ISO-27001:** Secured certification in 3 months

SKILLS

AI/ML & Architecture: Claude AI (Anthropic), MCP (Model Context Protocol), Multi-Agent Systems, RAG Pipelines, Prompt Engineering, LLM Evaluation, AI Governance & Safety, Tool Use, Embeddings, Vector Databases, TensorFlow, Quantitative Modeling, Multifractal Modeling (MMAR), Microservices, API Design

Cloud & DevSecOps: AWS, GCP, Azure, Kubernetes, Docker, Redis, Datadog, Kafka, Snowflake, ETL, LangChain

Solutions Architecture & GTM: Solutions Architecture, Forward Deployed Engineering, Enterprise GTM, Pre-Sales Strategy, Executive Engagement, Customer Success

Domains: Financial Services, Risk Management, Compliance, Capital Markets, Derivatives, XVA, Basel III/IV

Programming: Python, Java, Spring Boot, JavaScript, React, SQL, GitHub, Anthropic API

PROJECTS

Treasury PoC V1.5 — Forward Feasibility Test of Text-Aware Regime-Adjusted MMAR

- Published Treasury PoC V1.5 (SSRN Abstract ID 6584378), a forward feasibility test of Text-Aware Regime-Adjusted MMAR for 10-day VaR on synthetic UST book; architecture combines LLM-emitted six-dimension regime signal with multifractal volatility model.
- Designed Bar 2 forward discipline protocol (frozen corpus, single-pass scoring, pre-published thresholds) and deterministic three-input mapping (Hurst exponent, volatility multiplier, tail multiplier) with full audit trail from textual evidence to engine output.
- Pre-registered EMH-redundancy falsification protocol for V2 execution — Expected Shortfall as primary metric, named statistical tests, and quantitative falsification threshold; commits framework to publishing falsifying outcome if regime channel proves informationally redundant.
- Established three-lab adversarial review pattern (Claude / Gemini / Grok) for pre-publication discipline; incorporated substantive cross-model feedback into final publication.

Capital Markets Reconciliation Platform — Open Source | github.com/ananthaP6167/CapitalMarkets-Recon-Platform

- Designed and built a production-grade enterprise reconciliation platform (5,636 lines Python, 211 tests) with Claude agentic AI — 6 agents using Anthropic API tool use for break investigation, broker onboarding, pattern analysis, config review, signoff briefings, and natural language queries
- Engineered parallelized pipeline (config-driven transform + recon workers, Redis caching with Arrow IPC, queue-per-tier architecture) processing 100K+ records in under 300 seconds; scored AWS Well-Architected 5/5, 12-Factor 12/12, Capital Markets Ops 10/10
- Implemented production agent safety stack (human-in-the-loop write blocking, tool result envelopes, hallucination guard) with 5 resilience patterns (circuit breaker, retry with backoff, response cache, token budgets, concurrency semaphore); ML layer with SHAP explainability, self-healing breaks, and cross-pair anomaly detection
- Delivered multi-cloud K8s deployment, REST API (20 endpoints, OpenAPI 3.1), maker/checker workflow, data lineage with provenance tracing, DR (RPO 15min/RTO 30min), GDPR/MAS/SEC data residency, and SOC 2 Type II control mapping

CM·RAG — Capital Markets Knowledge Assistant — Open Source | github.com/ananthaP6167/cm-rag

- Built a fully browser-based RAG (Retrieval-Augmented Generation) application for capital markets professionals using the Anthropic API — single HTML file, no server, no install
- Engineered 25-document knowledge base spanning Basel III/IV, XVA, SIMM, FRTB, SA-CCR, EMIR, ISDA netting, and trade reconciliation; implemented keyword retrieval with relevance scoring across all corpus documents
- Delivered voice input (Web Speech API), retrieval trace panel exposing full RAG pipeline (tokenization → scoring → top-K → prompt construction → API call → response metadata), and configurable project settings; published to GitHub and showcased on LinkedIn in English, Chinese, and Hindi

PUBLICATIONS

Risk Intelligence: A New Era for Capital Markets — SSRN Working Paper (Abstract ID 6584378) | April 2026

- 27-page original framework combining Mandelbrot's fractal mathematics (MMAR, α-stable distributions) with LLM agentic intelligence for market risk, counterparty credit risk (XVA, PFE, wrong-way risk), and liquidity risk (LaR, execution strategy)
- Original contributions: LLM + MMAR integrated system architecture, Hurst-based barbell sizing rules, fractal PFE for XVA repricing, Clayton copula wrong-way risk detection, three-tier platform design (Cloud SaaS / Federated PaaS / Enterprise License)
- Proposes AI firm partnership thesis (Anthropic/DeepMind): fractal risk as verifiable training signal for LLM mathematical reasoning, agentic tool orchestration, long-context regulatory reasoning, and calibrated uncertainty — capabilities that transfer across all domains

Risk Intelligence: A New Era for Institutional Finance — SSRN Working Paper (Abstract ID 6615841) | April 2026

- 23-page institutional companion framework targeting CCPs, custodians, SIFIs, pension funds, and regulators — fractal precision for capital adequacy (Stable-VaR, H-adjusted scaling), sovereign architecture (Q/P separation with regulatory bridge to FRTB, SA-CCR, SIMM), and LLM-generated ICAAP/ILAAP supervisory narratives
- Original contributions: fractal SIMM add-on factors by asset class, BCBS 248 intraday liquidity clustering model, joint CCR + liquidity tail modeling via Clayton copula, and supervisory narrative feedback flywheel for frontier LLM training

EXPERIENCE

Founder & Principal Researcher — East Windsor, NJ
Capital Markets AI — *2026 – Present*

- Founded independent research and applied-AI venture at the intersection of capital markets risk management and frontier LLM research
- Dual-positioning targeting institutional finance buyers (CCPs, custodians, pension funds, regulators, treasury desks) and frontier AI research labs (Anthropic, DeepMind)
- Authored two SSRN working papers (Abstract IDs 6584378 and 6615841, 50 pages combined) on fractal risk intelligence combining Mandelbrot's MMAR with LLM agentic architecture; original frameworks for fractal PFE, Clayton copula wrong-way risk detection, BCBS 248 intraday liquidity clustering, and LLM-generated ICAAP/ILAAP supervisory narratives
- Designed and published Treasury PoC V1.5 (SSRN ID 6584378) — forward feasibility test of Text-Aware Regime-Adjusted MMAR for 10-day VaR on $30M synthetic UST book; Bar 2 forward discipline, EMH-redundancy falsification commitment, three-lab review
- Built open-source Capital Markets Reconciliation Platform (5,636 lines Python, 211 tests) with 6 agentic AI agents using Anthropic Claude API; established cross-model adversarial review across Anthropic, Google DeepMind, and xAI for all published research
- Built CM·RAG — browser-based Retrieval-Augmented Generation application for capital markets professionals using Anthropic API; 25-document knowledge base, voice input, retrieval trace panel, multilingual showcase

Principal Software Consultant — Jersey City, USA
Fidelity Investments — *2024 – 2025*

- Increased operational efficiency by 20% on Calypso implementation for collateral management, repo, and securities lending
- Assisted Fidelity's onboarding team across product rollout, report generation, and clearing validation
- Led Calypso implementation for collateral management, repo/lending, and interest/inflation swaps

Director — Product Engineering, Client Services & Sales — New Brunswick, USA
EZOPS Inc — *2017 – 2023*

- Led full sales cycle from POC scoping through contract close with tier-one capital markets institutions, increasing ARR by $15M for AI-powered compliance and reconciliation platforms
- Architected Java microservices, HTML5 interfaces, and TensorFlow-based ML algorithms, reducing data reconciliation time by 20% on 10M+ row datasets
- Built and managed 25-member engineering team in Chennai, attaining ISO-27001 certification in three months
- Partnered with sales leadership to identify AI use cases, scoping POCs and resolving adoption blockers

Global Head of Technology Presales — Enterprise Risk Solutions — New York, USA
Calypso Technologies Inc — *2004 – 2017*

- Owned full sales cycle from prospecting through close, selling $50M ARR in enterprise risk solutions to investment banking and capital markets clients including CME, HKMA, SGX, BOVESPA and other major exchanges
- Built and managed a global team of 10 Solutions Architects across North America, EMEA, and APAC — setting pre-sales engagement methodology, conducting performance reviews, mentoring technical talent, and scaling team capacity to support enterprise pipeline growth
- Led global delivery of derivatives trading solution for investment banking clients including Citigroup, HSBC, and other major banks
- Architected enterprise risk products for market, credit, XVA (CVA, DVA, FVA), and liquidity risk with Basel III compliance

Early Experience (Pre-2004) — New Jersey, USA

- Pinnacle Systems Inc — Manager/Architect, Global Delivery | IBM Global Services — Manager/Architect, Global Delivery

CERTIFICATIONS

Certificate in Quantitative Finance (CQF) — Paul Wilmott, New York
Certificate in Risk Management — Nassim Taleb, New York

EDUCATION

B.Sc. Applied Sciences (Mathematics & Physics) — Madurai Kamaraj University, India