

Matthew Collins

Senior Software Engineer • AI Systems Engineer • Blockchain Developer • KDB-X / PyKX / q Engineer • FinTech Product Architect

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[LinkedIn](#) • [GitHub](#) • [Drift Grid](#) • [Indigo Pascal](#) • [Zero Bank](#) • [Zero Blockchain](#) • [ZC-1](#)

EXECUTIVE PROFILE

Senior, multidisciplinary engineer with 15+ years building software, and over recent years full-stack fintech, AI and blockchain platforms end to end. I work primarily in Python and TypeScript across FastAPI/Node.js backends, React/Next.js frontends, KDB-X/PyKX/q and real-time market-data systems, RAG and vector search, and Solana/EVM smart-contract infrastructure. I take products from strategy and architecture through backend services, data pipelines, dashboards, deployment and documentation, with a strong bias toward observability, testing and compliance-aware design.

Current highest-value positioning: Python and TypeScript engineering, FastAPI/Node.js backends, KDB-X/PyKX/q, quant and market-data systems, AI-native engineering workflows, RAG/vector search, Solana/EVM infrastructure, regulated tokenisation, smart-contract operations and real-time financial data platforms.

Target roles	Senior Software Engineer, AI Engineer, KDB/q Developer, PyKX Developer, Quant/Data Engineer, Market-Data Engineer, Blockchain Engineer, Smart-Contract Engineer, FinTech Platform Engineer
Core stack	Python, FastAPI, Flask, Node.js, TypeScript, React, Next.js, Vite, Tailwind, Solidity, Hardhat, Ethers.js, Web3.js, DAML, kdb+/q, PyKX, SQL, PostgreSQL, TimescaleDB, Redis, Docker, AWS, Azure
AI / data	RAG, ChromaDB, Pinecone, Sentence-Transformers, OpenAI embeddings, Ollama, SSE streaming, vector ingestion, prompt evaluation, telemetry, pandas, NumPy, TensorFlow, Torch
Market systems	Tick architecture, TCA, VWAP, TWAP, slippage, bps cost, order-book modelling, oracle services, WebSockets, indexers, risk engines, real-time dashboards

SELECTED IMPACT & ACHIEVEMENTS

- Built Drift Grid, a live Solana-native perpetual DEX prototype covering product strategy, trading UI, backend services, an oracle service, risk-engine logic, indexer patterns, WebSockets, PostgreSQL/TimescaleDB, Redis, Docker and full observability.
- Built KDB TCA Workbench, a local-first kdb+/q engineering platform with a simulated tick plant, TCA analytics, q Lab, a RAG knowledge engine, benchmark suite, interview simulator and a FastAPI/React architecture.
- Designed ZC-1, an independently authored blockchain consensus mechanism combining DAG ordering, BFT checkpoints, VRF committee selection, mobile/light-client participation, data-availability sampling and compliance-aware architecture.
- Designed and built Zero ContractOps, a smart-contract operations platform using RAG, an adapter architecture, Hardhat compile/test/deploy, and EVM, Besu, GoQuorum, XRPL, Fabric and Corda support, with planned Solana/DAML modules.
- Architected and documented a 21-product Zero fintech ecosystem spanning banking, payments, wallets, compliance, SupTech, lending, core banking, insurance, wealth, green finance, AI advisory, trading, fraud, stocks, tokenisation, staking and DEX workflows.
- Delivered AI/RAG workflows with ChromaDB, Pinecone and Sentence-Transformers using token-aware chunking, metadata, citation controls, input/output validation, prompt-injection guards and human-in-the-loop review.
- Developed smart-contract libraries and repositories covering security tokens, subscription agreements, private placement memoranda, minting, transfer restrictions, lock-up, vesting, token splitting, asset tokenisation, governance, compliance and settlement.
- Built TypeScript + Three.js + Python parametric bridge-engineering workflows at Beaver Bridges, cutting early optioneering cycles by ~30% while supporting BIM/CAD output and design review.

FLAGSHIP PRODUCT PORTFOLIO

Drift Grid — Solana-Native Perpetual DEX Prototype [driftgrid.xyz](#)

- Built a professional on-chain derivatives trading platform prototype as a complete vertical slice: strategy, information architecture, design system, frontend, backend services and Solana/Anchor programme architecture.
- Implemented a CEX-grade terminal with Next.js 14, React 18, TypeScript 5, Tailwind, Zustand, Framer Motion, wallet-adapter and Solana tooling across landing, onboarding, trade, markets, portfolio, learn, admin and protocol pages.
- Architected Node.js/TypeScript services for a REST gateway, WebSocket fan-out, Solana event indexer, keeper automation, oracle service and risk-engine logic.
- Built platform infrastructure on PostgreSQL/TimescaleDB, Redis, Docker, Caddy, pgbouncer, OpenTelemetry, Prometheus, Grafana, Loki, Tempo, GitHub Actions, Helm, migrations, secrets management and runbooks.
- Embedded transparent risk principles: liquidation price, funding cost, fee impact, oracle drift, insurance fund, liquidation queue, position health and plain-English risk education.

KDB TCA Workbench — kdb+/q Engineering, TCA Analytics & RAG Platform

- Built a production-style quant-engineering workbench using FastAPI, React 18, TypeScript, Vite, Tailwind, ChromaDB, Sentence-Transformers, SQLite, Monaco Editor, Recharts, kdb+/q scripts and optional PyKX integration.
- Simulated a five-component kdb+ tick plant — feedhandler, tickerplant, RDB, HDB and gateway — with subprocess lifecycle control, logs, EOD cycle and query routing.
- Implemented TCA analytics: VWAP, TWAP, implementation shortfall, arrival-price slippage, cost in basis points, market impact, timing risk, venue rankings and broker comparisons.
- Added q Lab with Monaco q/k syntax support, code review, benchmark snippets, mock/live execution modes and q patterns for aj joins, attributes, grouped operations, IPC and window joins.
- Built RAG over 646+ KX documentation chunks with local embeddings, ChromaDB search, Ollama synthesis fallback, source scoring, a topic browser and a 120-question interview simulator across 15 capital-markets engineering categories.

Zero ContractOps — Multi-Ledger Smart-Contract Operations Platform

- Designed and built a smart-contract operations platform that turns business tasks into generated contracts, tests, deployment scripts, ABI manifests, risk summaries and operator guides through RAG-assisted workflows.
- Specified a real adapter architecture rather than a one-size-fits-all abstraction: EVMAdapter, EnterpriseEvmAdapter for Besu/GoQuorum, XRPL EVM and native adapters, FabricAdapter, CordaAdapter, and planned Solana/DAML/Cairo/Move adapters.
- Defined the MVP workflow: task capture, target-network constraints, RAG retrieval, Solidity generation, Hardhat compile/test, static checks, gas reporting, testnet deployment, registry indexing and an execution console with manual approval gates.
- Designed governance and safety controls: no mainnet by default, server-side key handling/wallet integration, transaction preview, gas estimates, ABI-generated function forms, role gating, audit trail and a deployment-readiness report.

Zero Blockchain ZC-1 — Independently Designed Consensus Mechanism [zero-blockchain-zc1.xyz](#)

- Authored the ZC-1 consensus mechanism independently as the technical foundation for Zero Blockchain.
- Designed a hybrid DAG-BFT architecture with DAG ordering, BFT checkpoints, VRF-selected committees, deterministic finality, data-availability sampling, mobile/light-client participation and delegated-staking patterns.
- Incorporated EVM interoperability, privacy controls, a zk-SNARK and post-quantum cryptography direction, ESG incentives, UK regulatory alignment, threat models, performance targets and testnet rollout planning.
- Produced a final technical whitepaper covering protocol design, cryptographic foundations, economic model, formal properties, pseudocode, governance direction and implementation roadmap.

Zero Bank & Zero Blockchain Product Ecosystem [zero-bank.xyz](#)

- Built and documented a decentralised digital-banking and fintech ecosystem combining blockchain, AI, wallets, payments, lending, compliance, analytics, DeFi, tokenisation, ESG, SupTech and core banking.
- Created product architecture across Zero Bank, Zero Blockchain, Zero Coin, Zero Tokens and the broader Zero suite, supported by whitepapers, product breakdowns, smart-contract repositories, dashboards and platform designs.
- Focused on UK regulatory themes including AML, KYC, GDPR, compliance monitoring, financial inclusion, sustainable finance, tokenomics and regulated digital-asset innovation; ran community engagement via Discord and NFT 'Space Race' events, with curation through ZeroArt.

ZERO PRODUCT SUITE — PRODUCT ARCHITECTURE & SPECIFICATION PACKS

Zero Blockchain	Decentralised blockchain ecosystem, ZC-1 consensus, token infrastructure and developer platform.	Zero Flow	Payment integration bridging Web2 gateways and financial-service workflows.
Zero Crypto Wallet	Multi-chain wallet for asset storage, connectivity, token management and Web3 UX.	Zero Pulse	Market analysis, portfolio and financial-assets app with real-time dashboards.
Zero Wave	Mobile banking and wallet model bridging traditional banking and blockchain rails.	Zero Pay	Global PayTech for cross-border, multi-currency, real-time payment flows.
Zero Comply	RegTech compliance automation across AML, KYC, monitoring and regulatory workflows.	Zero Supervise	SupTech market monitoring and oversight with AI-led risk signals.
Zero Lend	Blockchain P2P lending with smart-contract loan workflows and risk scoring.	Zero Core	Blockchain-backed core banking for modular operations and ledger workflows.
Zero Insure	InsurTech using blockchain, IoT data, fraud controls and dynamic premium logic.	Zero Wealth	Hybrid advisory combining AI guidance with human financial advice.
Zero Green	GreenTech crowdfunding and sustainable finance for verified impact projects.	Zero Insight	AI-powered personalised financial advisory / financial digital-twin platform.
Zero Trade	AI-powered multi-asset trading for signals, analytics and execution support.	Zero Predict	AI fraud detection and pre-emptive threat analytics for blockchain ecosystems.

Zero Stocks	Mobile stock-market app with predictive analytics and portfolio intelligence.	Zero Tokeniser	Real-world asset tokenisation for digitising, managing and trading assets.
Zero Stake	Cross-chain staking, liquidity provisioning and governance participation.	Zero Dex	DEX and AMM for swaps, pools, staking and cross-chain liquidity.
Zero Bank	Digital-banking ecosystem integrating blockchain, AI, payments, lending and inclusion.		

SMART-CONTRACT, DLT & CAPITAL-MARKETS REPOSITORIES

Repository / Platform	Evidence & value
Goldman-Sachs-Final	DAML/Canton-style portfolio project with daml and ui folders, DAML build workflow, JS/TS code generation, sandbox/HTTP JSON API flow and Daml Hub deployment packaging. Tokenised financial assets, ledger workflows and capital-markets smart-contract modelling.
State-Street-ERCs	Hardhat project (Solidity, JavaScript, TypeScript) with a State Street-themed security-token ITO, subscription agreement, PPM contract, minting, transfer restrictions, lock-up, vesting and token-splitter contracts, plus tests and ignition modules.
Smart-Contracts-Deployed-Modish	Asset-management Solidity repository structured across asset tokenisation, fund management, governance, compliance/regulatory, trading and settlement. Institutional smart-contract use-case modelling.
Smart-Contracts-Use-Cases (Zero Blockchain)	Sector-specific Solidity/Hardhat repository covering agriculture, construction, education, energy, environmental conservation, financial services, healthcare, manufacturing, property tokenisation, public sector, retail, NFTs, logistics, waste management and Chainlink identity patterns.

AI & LLM ENGINEERING — DETAILED CAPABILITIES

- **RAG pipelines:** retrieval-augmented generation with ChromaDB / Pinecone and Sentence-Transformers, including PDF/TXT ingestion, cleaning, token-aware chunking, metadata/citation tracking and incremental re-indexing.
- **Multi-agent orchestration:** tool-using agents (Python/TypeScript services) for retrieval, drafting, verifying and formatting, with deterministic hand-offs and retries for reliability at scale.
- **Streaming generation & UX:** Server-Sent Events from Flask to React/TypeScript for token-by-token updates, cancellation, timeouts and progress telemetry on long documents.
- **Prompt engineering & evaluation:** constraint-led prompts (structure, note markers, compliance rules), regression 'golden' tests and automatic prompt-drift detection.
- **Model ops:** local model hosting with Ollama, config-as-code for prompts/params, per-section token budgeting and caching, and health/metrics endpoints (latency, token use, cache hits).
- **Safety & governance:** guardrails for prompt-injection, PII scrubbing, citation thresholds and human-in-the-loop sign-off for safety-critical outputs (e.g. CG300 / Eurocode references).
- **Parametric workflows:** TypeScript + Three.js engine with Python optimisation generating geometry/options from key inputs (span, skew, clearance), driving BIM/CAD exports and cutting early optioneering by ~30%.

CORE TECHNICAL COMPETENCY MATRIX

Backend & APIs	Python, FastAPI, Flask, Node.js, TypeScript, REST APIs, WebSockets, SSE, Pydantic, Postman, RapidAPI, authentication flows, task workers, telemetry and error handling.
Frontend & UX	React, Next.js, Vite, Vue, Tailwind, TypeScript, Zustand, TanStack Query, Framer Motion, shadcn/ui, Aceternity, Material UI, Recharts, Monaco Editor, high-density dashboards.
KDB / capital markets	kdb+/q, PyKX, qSQL, tick plant, RDB, HDB, gateway routing, tickerplant, aj joins, VWAP, TWAP, slippage, implementation shortfall, order-book and market-data engineering patterns.
AI engineering	RAG, ChromaDB, Pinecone, KDB.AI, Sentence-Transformers, local embeddings, Ollama, OpenAI embeddings, prompt evaluation, golden tests, source attribution, vector ingestion pipelines.
Blockchain & smart contracts	Solidity, Hardhat, OpenZeppelin, Ethers.js, Web3.js, Remix, Truffle, Ganache, IPFS, Alchemy, Infura, wallet connectors, ERC-20/721/777/998/1155/1400/4626.
Enterprise DLT	DAML, Canton, Hyperledger Fabric, Besu, GoQuorum, Corda adapters, XRPL EVM and native XRPL workflow design.
Data & infrastructure	SQL, PostgreSQL, TimescaleDB, Redis, SQLite, MongoDB, DuckDB/Parquet, Docker, Docker Compose, AWS, Azure, S3, GitHub Actions, Prometheus, Grafana, Loki, Tempo.
Compliance & governance	AML, KYC, GDPR, MiCA awareness, audit trails, human approval gates, transaction preview, risk warnings, citation thresholds, PII scrubbing and prompt-injection controls.
Design & visualisation	AutoCAD, 3DS Max, Twinmotion, Figma, Adobe Creative Suite, Spline, Cinema4D, Three.js, parametric modelling and BIM/CAD workflows.

PROFESSIONAL EXPERIENCE

Systems Engineer — AI Designer

Apr 2025 – Present

Beaver Bridges Ltd · Manchester & Shrewsbury, UK

- Spearhead AI-driven bridge-design tools: ML-assisted option generation, structural-layout optimisation, materials/cost modelling and digital workflows for safety-critical infrastructure delivery.
- Built TypeScript + Three.js parametric modelling with Python optimisation services that generate bridge options from span, skew, clearance and constructability constraints — cutting early optioneering by ~30%.
- Introduced software-engineering discipline into engineering workflows: version control, automated tests, CI, structured documentation, visual review and safer hand-offs between design and fabrication.
- Embedded DMRB/Eurocode-style compliance checks into validators and review workflows while supporting BIM/CAD exports, geometry, schedules and fabrication-ready outputs.

Co-Founder & Director / Senior Software Engineer

Apr 2024 – Present

Indigo Pascal Ltd · Manchester, UK · indigopascal.com

- Co-founded (incorporated 18 April 2024) and direct a UK software company building across fintech, AI, blockchain, games, dashboards, technical consulting, white-label software and commercial digital products.
- Architect full-stack systems using React, Next.js, TypeScript, Node.js, Python (FastAPI/Flask), SQL/NoSQL, REST APIs, authentication, cloud deployment and secure integration workflows.
- Built the company proposition around AI engineering, Web3, financial dashboards, secure product delivery, technical documentation, investor-facing narratives, system design and product roadmaps.
- Deliver polished frontend interfaces, responsive layouts, chart-led dashboards, product demos, design systems and technical content for conversion, credibility and usability.

Founder & CEO

Mar 2023 – Present

Zero Blockchain / Zero Bank · Manchester, UK

- Founded and developed the Zero ecosystem (Zero Blockchain, Zero Bank, Zero Coin, Zero Tokens) and a broader fintech suite spanning banking, payments, lending, wallets, compliance, DeFi, tokenisation and AI analytics.
- Engineered Solidity smart-contract repositories using Hardhat, OpenZeppelin, Ethers.js, Web3.js, Alchemy, Infura and IPFS across EVM networks and testnets.
- Authored whitepapers and product architecture covering blockchain consensus, decentralised banking, tokenomics, conservation-linked tokens, ESG, UK compliance and financial inclusion.
- Built technical assets for smart contracts, dashboards, token management, market analytics, regulatory-compliance tools, DeFi and Web2/Web3 interoperability.

Managing Director & Senior Software Engineer

Mar 2023 – Present

Modish 0161 · Manchester, UK · modish0161.com

- Developed responsive web applications, blockchain interfaces, smart-contract demos, APIs, dashboards and product prototypes using React, Next.js, TypeScript, Node.js, Python, Solidity and Web3 tooling.
- Built and maintained public GitHub repositories for deployed smart contracts, industry use cases, institutional asset-management projects and Solidity/Hardhat structures.
- Integrated Stripe, PayPal, Clerk, Auth0 and Plaid-style payment/authentication patterns, cloud services and API workflows across fintech and product builds.
- Combined product design, technical writing, UI/UX, full-stack engineering, blockchain development and digital brand execution for client-facing and portfolio projects.

Senior Architectural Technologist & Design Lead

2005 – 2023

Architecture & design technology · UK

- Delivered architectural technology across commercial, residential, cinema/leisure, sports retail, cladding, roofing and structural-interface projects: working drawings, planning and Building Regulation submissions, technical detailing, shell packages, fabrication coordination and site support.
- **MPSL (contract, via machudesign.xyz), Manchester — Jun 2022–Mar 2023:** Sports Direct development in London and house types for a Fleetwood housing estate; architectural drawings, Permitted Development packages and Building Regulation approvals.
- **Machudesign Ltd (own company), Manchester — Sep 2019–Jun 2022:** business development, project design and delivery, employee management, and compliance with SDS, Robust Details and NHBC Building Regulations.
- **NBDA — Northern Building Design Associates, Cheshire — Jan 2019–Sep 2019:** projects for Odeon, IMAX, Cineworld and Haven Holiday Parks; building-shell technical and working-drawing packages with fabricator/installer liaison.
- **Machudesign Ltd (freelance), Manchester — Apr 2009–Jul 2017:** housing extensions and conversions, planning applications, building-regs compliance, CSS-built websites and 3D walkthroughs/visualisations.
- **Taylor Young Ltd, Handforth/Wilmslow — May 2007–Apr 2009:** helped supervise a 200-build housing estate; advised site managers and clients; outlined three-storey apartment blocks and housing schemes.

- **Lakesmere Ltd, Lymm/Warrington — Jan 2005–May 2007:** drafted and supported architects, structural engineers and drawing managers; produced GA and technical drawings across all design phases.
- Earlier: trade and construction experience with Pendragon Construction Ltd (roofing, cladding, masonry, joinery and renovation). Architectural systems thinking now informs my software, UX, dashboards, parametric modelling, visualisation and digital-twin work.

Editor-in-Chief & Financial Content Builder
2000 – 2002 (ongoing direction)

Moo-Lah.io / moolah.website · Manchester, UK

- Built a financial-education and content platform from inception, producing and curating 1,500+ articles across markets, personal finance, entrepreneurship and financial literacy.
- Combined editorial strategy with technical product work for data-led finance content, dashboards and educational tools.

Data Input Specialist (Part-Time)
Jul 2000 – Sep 2002

Co-operative Bank · Stockport, UK

- Processed variable balance transfers, credit-card applications and customer data while maintaining security, record accuracy, compliance and operational data quality.

EDUCATION

Manchester Metropolitan University	MSc Financial Technology, Distinction (2024–2025). Focus: blockchain, DeFi, financial engineering, regulation, data and digital innovation.
University of Salford	BA (Hons) Spatial Design / Architecture & Contemporary Structures (2001–2005).
Loreto Sixth Form College	Advanced GNVQ Art & Design; CLAIT Computer Literacy & IT (1999–2001).
Thomas Holford R.C.H.S	10 GCSEs; Intermediate GNVQ Art & Design (1994–1999).
Research direction	Progressing toward PhD-level research in Blockchain & AI — decentralised technologies and intelligent systems in financial markets, public infrastructure and enterprise systems.

PUBLICATIONS, WHITEPAPERS & BOOKS

- ZC-1 Zero-Blockchain Consensus Whitepaper, v1.0 Final, 11 Sep 2025 — independently authored: DAG-BFT consensus, VRF committees, BFT checkpoints, data availability, privacy, quantum resistance, ESG, UK compliance and testnet roadmap.
- Zero-Bank: Revolutionising Digital Banking in a Decentralised Era, v1.0, 14 Jan 2025 — blockchain, AI, sustainable finance, digital banking, payments, lending, compliance, inclusion and platform architecture.
- Zero-Blockchain XYZ: Pioneering Decentralised Innovation, v1.0, 13 Jan 2025 — blockchain architecture, sustainability, tokenomics, DeFi, developer ecosystem and observability.
- Zero-Coin ICO, v1.0, 15 Jan 2025 — native cryptocurrency, tokenomics, DeFi utility, regulatory strategy, payments and UK market positioning.
- Zero-Tokens ICO, v1.0, 15 Jan 2025 — 50 ERC-20 conservation tokens, Ethereum interoperability, DeFi integration, metadata, gamification and environmental impact.
- **Books (as MJ Collins):** Accelerate Your Wealth; The Fastlane Entrepreneur; Fast Track to Riches; The Money Maker's Playbook.

KX · KDB · PYKX · QUANT CERTIFICATION BANK

Certification	Provider	Date
KDB-X Python — Level 2	KX Academy	28 May 2026
q Developer — Level 3 (Course Completion)	KX Academy	17 May 2026
Introduction to KDB-X	KX Academy	27 May 2026
KDB-X Dashboards	KX Academy	28 May 2026
Introduction to Quant Trading	KX Academy	17 May 2026
KDB-X Python — Level 1	KX Academy	4 Mar 2025
kdb+ Developer — Level 2 (Course Completion)	KX Learning Hub	8 Mar 2025
KDB-X SQL (Course Completion)	KX Academy	4 Mar 2025
SQL for kdb (Course Completion)	KX Learning Hub	4 Mar 2025
Introduction to PyKX	KX Learning Hub	4 Mar 2025
KDB.AI Vector Database	KX Learning Hub	4 Mar 2025
kdb+ Architecture	KX Learning Hub	4 Mar 2025
kdb+ Insights Enterprise — Level 1	KX Learning Hub	4 Mar 2025
KX Dashboards (Course Completion)	KX Learning Hub	5 Mar 2025
q Developer — Level 1 Quiz / KDB+/Q Level 1	KX Academy / KX Systems	28 Apr 2024

Certification	Provider	Date
KDB+/Q — Introduction to Databasing	KX Systems	Apr 2024

ADDITIONAL CERTIFICATIONS, CPD & PROFESSIONAL TRAINING

Software Engineering Skills-City Bootcamp (Gold Award, Jan 2024); Blockchain — Learning Solidity; Building Web3 Decentralized Apps in Ethereum; Career Essentials in Data Analysis (Microsoft & LinkedIn); Learning Data Analytics 1-2 (Foundations, exam passed; Extending & Applying Core Knowledge); Cisco Python Essentials 1 (Modules 2.5-3.8); Agile Requirements Foundations; Business Analysis Foundations (incl. Business Process Modelling, BA-PM Collaboration, Benefits Realisation, Requirements Elicitation & Interviews); Project Management Foundations; Managing Projects with Microsoft 365; SQL Server Fundamentals; Introduction to AI (2023); What Is Generative AI?; Ethics in the Age of Generative AI; Generative AI & Thoughtful Online Search; Learning Data Science Basics; Streamlining Your Work with Copilot.

Memberships & built-environment CPD: Chartered Institute of Architectural Technologists (ACIAT, Mar 2006); Chartered Society of Design (May 2004); CSCS Health & Safety; CDM & Risk Assessment; Kalzip Approved Contractors Designer Course; Sarnafil Design Course; SFS Intec and Geo-Cel/Dow Corning RIBA CPDs.

FULL TECHNOLOGY STACK

Frontend	HTML, CSS3, Tailwind, JavaScript, TypeScript, React, React Native, Next.js, Vue, Redux, React Query, Zustand, Framer Motion, shadcn/ui, Aceternity, Material UI, Recharts, Monaco Editor.
Backend	Python, FastAPI, Flask, Django, Node.js, Express/Fastify, Golang, SQL, PostgreSQL, TimescaleDB, MySQL, SQLite, MongoDB, Redis, Drizzle ORM, DuckDB/Parquet.
Blockchain	Solidity, Hardhat, Ethers.js, Web3.js, Remix, OpenZeppelin, Truffle, Ganache, IPFS, Pinata, Alchemy, Infura, Etherscan, MetaMask, WalletConnect, walletlink, Core wallet.
Standards & networks	ERC-20/721/777/998/1155/1400/4626, Ethereum, Polygon, Sepolia, Goerli/Rinkeby (legacy), Cronos POS, Avalanche, Solana/Anchor, XRPL.
AI / ML / data	ChromaDB, Pinecone, KDB.AI, Sentence-Transformers, Ollama, TensorFlow, pandas, NumPy, Torch, Hugging Face, SymPy, NetworkX, OpenAI embeddings, vector stores, RAG evaluation.
Cloud & DevOps	AWS, Azure, S3, Docker, Docker Compose, GitHub Actions, Prometheus, Grafana, Loki, Tempo, OpenTelemetry; working knowledge of Jenkins, Kubernetes/Helm and Terraform.
Design / CAD / multimedia	AutoCAD, 3DS Max, Twinmotion, Adobe Photoshop, Illustrator, InDesign, After Effects, Figma, Spline, Cinema4D, Draw.io, Mermaid, Eraser.io.
Music & sound engineering	Cubase 12, Pro Tools, Ableton Live, Reason 12, Native Instruments, Solid State Logic, Waves, FabFilter, iZotope, Serum, Massive X, Omnisphere, Soundtoys, Falcon UVI.

PORTFOLIO EVIDENCE & RECRUITER POSITIONING

Evidence link	What it demonstrates
driftgrid.xyz	Live Solana perpetual DEX prototype — product, frontend, backend, WebSocket, risk-engine, indexer, oracle and observability.
github.com/modish0161	Public GitHub profile — smart-contract, DAML, Solidity, Web3 and product-engineering repositories.
State-Street-ERCs	Hardhat/Solidity institutional security-token contracts, test structure, ignition modules and compliance-themed ERC patterns.
Goldman-Sachs-Final	DAML/Canton-style financial-asset smart-contract portfolio with DAML build, generated JS/TS bindings and UI workflow.
Smart-Contracts-Deployed-Modish	Asset-management smart-contract repository covering tokenisation, funds, governance, compliance and trading/settlement.
Smart-Contracts-Use-Cases	Industry-specific Solidity use-case library across finance, property, public sector, healthcare, logistics, energy and environment.
zero-blockchain-zc1.xyz	ZC-1 consensus and Zero Blockchain technical positioning.
zero-bank.xyz	Zero Bank / Zero Blockchain ecosystem — digital banking, DeFi, tokenisation and sustainable finance.

Best-fit role families: KDB/q, PyKX & market-data engineering; senior Python / AI systems engineering; backend platform engineering; blockchain / Web3 / smart contracts; FinTech product architecture.

Recruiter summary: I am strongest where high-performance financial systems, AI-native engineering, KDB/q, Python, TypeScript, Web3 infrastructure, smart-contract operations and product-grade UX meet. I can contribute as a senior hands-on engineer, product-minded platform builder or technical lead across capital markets, fintech, AI systems and blockchain infrastructure.

ADDITIONAL PRODUCT PORTFOLIO — CLIENT & COMMERCIAL BUILDS (2025–2026)

A further portfolio of full-stack products, platforms and client builds delivered end to end (2025–2026) across AI voice systems, procurement-intelligence engines, a creator video platform, Web3, marketplaces and operational SaaS. Each is documented in a standalone technical brief.

121BG AI Voice Agent Platform — Multi-Tenant AI Voice Platform (deployed)

- Built a multi-tenant, white-label platform end to end — FastAPI backend (~15 API modules, 12 data models, JWT + RBAC), a fleet of LiveKit Python voice-agent workers (OpenAI / Deepgram / ElevenLabs / Cartesia STT-TTS) and a Next.js 15 admin portal — with agents that answer and place real phone calls.
- Agents connect to the phone network via a LiveKit SIP bridge and Twilio and take real actions mid-call (availability checks, orders, tickets) through authenticated tool-calls; per-tenant knowledge in PostgreSQL + pgvector (RAG).
- No-code Agent Studio with live MOS-scored test calls; GDPR-aware (PII redaction, recording consent, audit logging); Docker/Caddy, Redis, Temporal, Kafka, Sentry/Prometheus/OpenTelemetry. ~21,500 lines; live across telecoms, restaurant, florist and garage verticals.

Beaver Bridges Opportunity Engine (BBOE) — UK Procurement Intelligence (production)

- FastAPI + PostgreSQL + Celery/Redis platform that ingests UK tenders (Contracts Finder, Find a Tender), runs a rule-based classifier and a 10-dimension weighted scoring engine, and generates 15-section bid briefs.
- Encrypted credential vault and Playwright automation covering ~116 e-sourcing portals (Jaggaer, ProContract, In-Tend, EU-Supply); Next.js 14 front end; JWT, 8-role RBAC, TOTP 2FA; Docker + Nginx HTTPS on a Linux VPS.

DRNM Opportunity Engine — Opportunity Intelligence & Bid Platform (live) drnmoppeng.com

- Zero-dependency production single-page app consolidating 460+ global funding & contract sources: a vanilla-JS front end over IndexedDB with a Node.js standard-library backend (session auth, CORS-bypassing fetch proxy, cost-capped AI integration) for speed, portability and a small attack surface.
- Fit-scoring across every source, live RSS/JSON/HTML scanning, tender-pack reading and bid-pack generation; containerised with Docker behind an nginx reverse proxy with automated TLS and a single-user lock.

Machu Design Opportunity Engine (MDOE) — Architectural Lead-Generation Platform

- React 19 / Vite dashboard over a FastAPI backend with a rule-based lead classifier and a transparent 0–100 service-and-commercial scoring engine for an architectural consultancy.
- Pluggable UK procurement / planning source-adaptor layer (Find a Tender, Contracts Finder, BidStats, council planning) with normalisation and deduplication; Docker-packaged.

Oddly Useful — Programmatic-SEO Tools Platform (live) oddlyuseful.xyz

- ~675 interactive, framework-free vanilla-JavaScript tools defined as data; a custom build-time static-site generator pre-renders ~2,000 SEO-optimised HTML pages with sitemaps, generated OG images and a PWA service worker — architected to scale to 10,000 pages.
- Built-in tool registry classifying every page by commercial intent and monetisation type (ads / affiliate / lead-gen / sponsorship); automated link-checking and build verification.

PALMSIGNAL — Creator-First Video Platform with Ledger-Backed Monetisation

- Next.js 16 / React 19 over PostgreSQL (Drizzle, 64 tables) with a Mux video pipeline and a separate BullMQ transcoding worker, Stripe payouts, live streaming and vertical shorts.
- Financial correctness by construction: an immutable integer-minor-unit double-entry ledger, effective-dated revenue splits and a constraint-enforced payout waterfall; bespoke neo-skeuomorphic design system, trust-and-safety tooling and a versioned public API.
- ~55,000 lines, 48 API routes, 48 tests (Vitest + Playwright); containerised for VPS behind Caddy.

QUALORA — International Professional-Exam Intelligence Platform

- Contract-first Next.js 16 monorepo over PostgreSQL 17 + pgvector (Drizzle, 37 tables), with a rigorous i18n model separating market, jurisdiction, locale, currency and legal-terms version.
- Correctness enforced by the database — append-only attempt ledger, server-side-only marking (answer key never reaches the client) and index-level idempotency; explainable versioned analytics and a governed JSON import pipeline; 87 passing tests.

Solana Advanced Airdrop DApp — Full-Stack Web3 (Rust / Anchor + Next.js)

- Rust/Anchor smart contract (initialise / deposit / claim) with PDA vaults, on-chain admin authority, double-claim prevention, bump validation and checked arithmetic, integrated with a Next.js wallet-adaptor front end and a full transaction lifecycle (sign, confirm, explorer links, error translation).
- Audited and remediated an untrusted third-party scaffold, then rebuilt the empty program and placeholder front end; documented residual-risk register (devnet, unaudited).

Time — Workforce Operations Platform (client build)

- Next.js 15 / React 19 over a 15-model PostgreSQL / Prisma schema tying time, leave, sickness and allowances directly to jobs, so fortnightly payroll is prepared from operational data (planner, timesheets, leave, sickness, payroll) for electrical contractors.
- NextAuth role-based access (admin / manager / engineer) enforced in middleware, audit logging, Excel export, and a premium animated dark-by-default UI (shadcn/ui + Aceternity + Motion).

TradeProof — Verified-Services Marketplace

- Next.js 14 with three role-based dashboards (customer, professional, admin) over a 31-model Prisma / PostgreSQL schema covering the full lifecycle from lead to payout.
- A verification pipeline (identity, business, insurance, accreditation) plus an explainable 'ProofScore' trust signal, a 'ProofPilot' AI brief generator, and milestone / escrow-style payments — with every third-party dependency behind a swappable boundary.