

Ziad Alzarka

Senior Software Engineer — Backend, Platform & AI Systems

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SUMMARY

Senior engineer and systems architect, **9 years** building **data-intensive platforms** across the **financial and medical domains** — double-entry ledgers, reconciliation and AP automation; AI diagnosis, claims and lab data pipelines. Designs **AI agents and workflows that automate engineering itself**, and works comfortably from Kotlin/JVM services and Postgres query plans to Rust distributed systems.

WORK EXPERIENCE

Light — Remote

December 2025 – Present

Senior Software Engineer, Procure-to-Pay & Record-to-Report

Backend engineer on the team owning AP automation, procurement, the approval engine and the accounting ledger in a Kotlin modular monolith.

- **Founded and led the company's AI engineering platform.** Built an autonomous Claude Code agent turning a GitHub issue or Linear ticket into a reviewed pull request — phased planning/execution workflows, MCP access to Slack, Linear and Datadog, and a migration from the Anthropic API to AWS Bedrock for compliance.
- **Shipped the multi-agent PR review fleet now running on every backend PR** — independent architecture, security, product-logic and code-standards reviewers posting inline findings, rolled out from a pilot allowlist to the whole backend org.
- Authored the agent tooling layer the org develops against: reusable planning, debugging and documentation skills, an automated PR-authoring and release workflow, and per-module instruction files that cut agent context overhead on a large codebase.
- **Eliminated the failure mode that took production down twice.** Migrated the ledger's hottest endpoints from offset to **keyset pagination** over multi-million-row tables — index-seekable row comparison, capped offset depth, read-replica routing and the covering indexes to match.
- Designed a **durable resumable CSV export pipeline** — checkpointed S3 multipart uploads with a 72-hour resume window and hybrid sync/async delivery — so multi-million-row exports stopped exhausting the connection pool.
- Built the **bill-to-purchase-order matching and goods-receipt flow** at the core of three-way matching: PO number extraction from invoice OCR, automatic matching with outcome metrics, and interactive Slack confirmations that let requesters confirm delivery without entering the app.
- Instrumented the domain in **Datadog** — orphaned-approval gauges, query-shape and pagination-depth distributions — turning silent data-correctness failures into alertable signals, and extracted a reusable **idempotency module** now used across four domains.

Technologies: Kotlin, Java 17, Gradle, PostgreSQL, Exposed, Guice, JAX-RS, AWS (S3, SNS/SQS, Bedrock), Kubernetes, Terraform, Helm, Datadog, JobRunr, Claude Code, Claude Agent SDK, MCP, GitHub Actions.

Ankor.app — Malmö, Sweden (Remote)

July 2025 – November 2025

Senior Software Engineer

Led technical development of a financial reconciliation platform for e-commerce businesses, inception to production.

- Architected a multi-tenant SaaS platform processing **millions of transactions monthly at 98%+ reconciliation accuracy**, integrating 5+ payment providers (Shopify, Klarna, PayPal, Plaid, Adyen).
- Built a four-tier data pipeline (raw → staging → fact → app) with dbt and Python ETL, enabling transaction matching, multi-currency support and automated double-entry journal generation.
- Delivered the full product surface: React/TypeScript frontend, GraphQL API and NestJS backend, with settlement tracking, audit trail and Excel financial reporting including an **ML-based refunds accrual forecast**.
- Established engineering foundations — monorepo tooling, test framework, CI/CD to GCP, and a split transactional (PostgreSQL) / analytical (BigQuery, MotherDuck) data architecture.
- Took the platform to production and **4 paying customers in 3 months** before the company wound down on funding constraints.

Technologies: TypeScript, React, NestJS, GraphQL, PostgreSQL, BigQuery, MotherDuck (DuckDB), dbt, Python (dlt), Apache Airflow, GCP, Auth0, Tailwind CSS.

Adia Health (formerly Flow Health) — Remote

January 2021 – June 2025

Senior Software Engineer

Led technical development of an AI-powered medical assistant for laboratories, physicians and insurers — AI diagnosis and test recommendation, claim filing, fee schedules, vector search and real-time cross-database replication.

- **Recovered a completely lost production database of ~1.5 billion records** by replaying events reconstructed from Kafka, CloudWatch and S3.

- Migrated the primary datastore from **Cassandra to DynamoDB**, improving availability and performance while cutting maintenance and cost by **90%**.
- Integrated **vector search into the medical knowledge graph** using AWS OpenSearch, tuned for high-volume ETL workloads.
- Introduced a graph database for relationship-heavy queries, **reducing aggregation latency by 35%**; reworked data services to remove race conditions and ACL overhead, **cutting latency a further 20%**.
- Built ingestion pipelines normalising unstructured medical history and embedded software streaming results from Sysmex lab analysers; set the team's CI, code-standards and RFC practices.

Technologies: TypeScript, React, NestJS, Cassandra, DynamoDB, AWS Neptune, PostgreSQL, Python, AWS, OpenSearch, SageMaker, Kafka.

CoatConnect — Cairo, Egypt January 2019 – December 2020

Software Engineer

Accelerated development of a web portal connecting doctors to medical events and conferences.

- Optimised performance and bundle size to a **1.7s Largest Contentful Paint**, and added server-side rendering for SEO.
- Built the shared UI library that shortened new-view delivery, a web scraper enriching the platform with medical event data from multiple sources, and integrations for payments, analytics and marketing automation.

Technologies: TypeScript, React, NestJS, Node.js, MongoDB, AWS.

BirdCloud — Cairo, Egypt January 2017 – December 2018

Software Engineer

Built software digitalising client operations across legal, medical and laundry domains.

- Built a shared UI and utility library that cut delivery time enough to take on **20% more clients and a 30% revenue increase**, working directly with clients to scope and shape delivery.

Technologies: TypeScript, Angular, React Native, MySQL, C# .NET.

PROJECTS

Magmooty — github.com/magmooty/monorepo March 2025 – Present

Offline-First Distributed System (Rust, Go, Tauri)

An offline-first education management platform for regions with unreliable connectivity — cryptographic sync, cross-language FFI bridges, peer discovery and BLE attendance behind a cross-platform desktop app.

- Architected the **sync engine in Rust** on SurrealDB/RocksDB: master-replica LAN replication and chunked last-write-wins batching with a **hybrid logical clock** for online sync, authenticated with RSA-2048/RS256 JWTs for zero data loss and MITM resistance.
- Engineered a **Go-to-Rust FFI bridge**, compiling a WhatsApp bot to a C static library (CGO c-archive) exposing an async C ABI consumed through Rust unsafe bindings.
- Built a **UDP broadcast auto-discovery protocol** with subnet calculation and multi-NIC handling, plus a BLE peripheral scanner for proximity-based attendance.
- Shipped an **Axum REST API** with record-level permissions and time-bound 2FA, and a Docker cross-compilation pipeline targeting **6 architectures** with signed auto-updates and RTL Arabic PDF generation.

Technologies: Rust, Axum, Tauri, Go, SurrealDB, RocksDB, SQLite, TypeScript, Svelte, Tailwind CSS, Docker, DigitalOcean.

SKILLS

Programming	Kotlin, TypeScript, Python, Rust, Go, SQL, Java, C#
AI & Agents	Claude Code, Claude Agent SDK, Anthropic API, AWS Bedrock, Model Context Protocol (MCP), multi-agent orchestration, LLM code review, RAG and vector search, OpenAI GPT
Backend	JVM services (Guice, JAX-RS, Exposed), NestJS, Node.js, Axum, GraphQL, REST API design, event-driven architecture (SNS/SQS, Kafka), background jobs, idempotency, distributed transactions
Data	PostgreSQL (query planning, indexing, keyset pagination, replication), DynamoDB, Cassandra, MongoDB, MySQL, Redis, SurrealDB, Neptune, OpenSearch, BigQuery, DuckDB, dbt, Airflow
Infra & Ops	AWS (S3, SNS/SQS, Lambda, Bedrock, OpenSearch), GCP, Kubernetes/EKS, Docker, Terraform, Helm, GitHub Actions, CI/CD, Datadog (metrics, APM, distributed tracing, monitors)
Frontend	React, Next.js, Svelte, Angular, React Native, Tailwind CSS, Core Web Vitals optimisation
Domain	Double-entry accounting, AP and procurement, payment reconciliation, VAT compliance, approval workflows, multi-tenant SaaS
Spoken	English — fluent (professional working proficiency); Arabic — native

EDUCATION

Kafrelsheikh University — Egypt · Bachelor of Science, Computer Science 2018 – 2022