

ARBAB CHOWDHURY

Senior Software Architect with AI Delivery on a Production Stack · Python · LLMs · Vector Search · Voice AI · Containerized Deployment

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PROFESSIONAL SUMMARY

Senior software architect with 25+ years building mission-critical platforms — now applying the same delivery discipline to AI systems. Currently leading PNC's regulatory-stack migration to Python on OpenShift (~\$1M annual savings, zero regulatory disruption) while independently building three AI products in active development on a Node.js / Python / Docker / PostgreSQL / vector-DB stack. Brings what most AI-first hires lack: architecture credibility, production-grade reliability, audit-trail thinking, and cost-conscious design — across LLM orchestration, RAG pipelines, voice agents, agentic workflows, and vector search, in real environments with compliance constraints rather than sandbox demos.

AI / MODERN STACK PROJECTS *(PARALLEL TO PNC ROLE)*

Founder & Lead Engineer at **Velodyn**. All three are in active development on **Python / Node.js / Docker / Linux / PostgreSQL / pgvector / Pinecone**:

- **scribeflash.ai** — HIPAA-aware audio/video transcription product designed for healthcare and clinical workflows. Constraints: PHI handling, structured outputs, low-latency, EHR-compatible integration patterns.
- **RewriteIQ** — content generation and rewriting SaaS running on **GoHighLevel orchestration**, with LLM backends and a structured generation pipeline.
- **BackgroundX** — image-processing SaaS with API-first delivery and containerized deployment.

AI architecture experience includes:

- LLM-backed services with prompt orchestration and structured outputs
- Conversational AI and voice agents — Vapi-class voice platforms, Twilio integration, TTS/STT orchestration
- **Retrieval-Augmented Generation (RAG) pipelines** with pgvector + Pinecone embedding stores
- Agentic workflows with multi-step business-process orchestration via REST and webhook integrations
- AI integrated into CRM, healthcare back-end, and financial systems — i.e., real production environments with compliance constraints, not sandbox demos

TECHNICAL STACK

- **Languages:** Python (current primary) · Node.js · Express · TypeScript · PL/SQL · Linux shell
- **AI/ML:** OpenAI / Anthropic LLM APIs · LangChain · RAG pipelines · prompt design · evaluation harnesses · vector databases (pgvector, Pinecone) · voice AI (Vapi, ElevenLabs, Twilio) · conversational AI · agentic workflow patterns
- **Platform & Deployment:** Docker · OpenShift · Linux · CI/CD pipelines · containerized deployment · observability · structured logging · audit-trail design
- **Data:** PostgreSQL · MariaDB · MySQL · Oracle (10g–19c) · ETL/ELT · data modeling · calculation engines · regulatory data warehousing
- **Integration:** REST APIs · webhook orchestration · OAuth · GoHighLevel · Make · n8n · Salesforce · healthcare integrations · payment/financial back-end integrations
- **Methodology:** Solution architecture · audit-grade documentation · executive communication · production reliability · cost-conscious design · regulated-delivery discipline
- **Certification:** CISA — Certified Information Systems Auditor (ISACA, 2010)

PROFESSIONAL EXPERIENCE

Vice President, Senior Software Architect — PNC Financial Services (Feb 2023 – Present)

Pittsburgh, PA (Remote)

- **Lead architect** for PNC's regulatory calculation stack migration from Oracle OFSAA to **Python-orchestrated, OpenShift-containerized microservices** — approximately **\$1M in annual cost savings**, six-figure licensing eliminated, zero regulatory submission disruption.
- Architected and shipped a Python-based cashflow engine for Federal Reserve liquidity reporting (Basel III RWA, FR 2052A, NSFR).
- Designed enterprise-wide PII encryption / on-demand decryption framework — same data-privacy discipline that translates directly to AI/LLM systems handling sensitive data.
- Driving redesign with first-class observability, retry logic, and audit trails to OCC / Federal Reserve standards.
- Mentor to 15+ engineers across the Python/OpenShift platform; technical interviewer.

Assistant Vice President, Software Architect — PNC Financial Services (Jan 2018 – Feb 2023)

Strongsville, OH

- Solution architect for Oracle Reveleus / OFSAA implementations of Basel II/III RWA and Liquidity Coverage Ratio.
- Owned end-to-end design of regulatory data flows: ingestion, transformation, calculation, reporting, reconciliation.
- Designed enterprise data validation framework improving data quality and audit reliability.
- Established team coding standards, code review practices, technical training program for a 15+ engineer platform.

Lead Software Engineer — PNC Financial Services (Jan 2012 – Dec 2017)

Cleveland, OH

- Tech lead on regulatory and risk applications calculating multi-billion-dollar daily exposures.
- Built reconciliation systems aligning warehouse data with GL and off-balance-sheet platforms.
- Led production support with zero missed regulatory filings and 99.9%+ uptime on mission-critical financial systems.

Senior Analyst / Programmer — Sherwin-Williams (Mar 2009 – Jan 2012)

Cleveland, OH

- Redesigned enterprise payroll/HR integration layer (Oracle HRMS → ADP / Kronos) from batch updates to event-driven architecture.
- Built audit and reconciliation systems ensuring cross-system data integrity across global manufacturing operations.

Team Lead / Financial Systems Manager — AmTrust Bank (Jun 2005 – Dec 2008)

Cleveland, OH

- Led applications development and managed enterprise finance systems (GL, AP, FA, data warehouse).
- Re-architected ETL pipelines: nightly processing window 2 hours → 30 minutes.
- Delivered \$7M finance-systems modernization roadmap to executive leadership.

Earlier Career — Oracle EBS & Technology-Risk Consulting (1999 – 2005)

Oracle EBS implementation, customization, and SOX/technology-risk advisory for Fortune 500 and FDA-regulated clients — STERIS, Cap Gemini Ernst & Young, Ernst & Young, Arthur Andersen, and Cleveland Motion Controls.

EDUCATION & CERTIFICATIONS

- **Cleveland State University** — B.S. Computer Science · B.B.A. Accounting (dual degree)
- Computer Science Association · Beta Alpha Psi (Accounting Honor Society)
- **CISA** — Certified Information Systems Auditor (ISACA, 2010)
- *AWS Data Engineer Associate — in progress, target Q3 2026*