Michael L. Welles

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Overview

Distinguished engineering leader with 20+ years building secure, compliant systems across regulated industries. Proven track record driving transformational architecture outcomes at enterprise scale while balancing innovation with risk mitigation and regulatory compliance. Excel at cross-organizational influence—partnering with CTO, CISO, Risk, and Architecture teams to align technical excellence with business value and audit readiness. Deliver secure-by-design platforms that operate reliably at scale while meeting stringent governance requirements. Equally comfortable crafting enterprise architecture strategy, writing reference implementations, or presenting to C-suite stakeholders.

Core Technologies

Languages & Frameworks: Python, Rust, Go, C#, TypeScript, Swift, Kotlin, Java **Data & Databases:** Databricks, Spark, PostgreSQL, DynamoDB, Elasticsearch **Cloud & Infrastructure:** AWS (SQS/SNS, S3, IAM, VPC, SageMaker), Azure, GCP, Kubernetes, Docker, Terraform **Security & Compliance:** Zero-trust architecture, cryptographic verification, DoD compliance, threat modeling, architectural risk analysis **Architecture Patterns:** Event-driven systems, distributed systems, cloud-native platforms, microservices, observability **Frameworks & Standards:** Regulatory compliance (OCC, FFIEC, SOX, GLBA), NIST, enterprise architecture

Experience

Consulting Principal Engineer, CubeNexus.ai

Aug 2025 - Present · Remote

Advising on technical strategy and architecture for a geospatial intelligence platform with LLM-based querying and 3D visualization. Rebuilt ingestion pipeline to handle multi-terabyte datasets (PySpark, Pandas), added real-time telemetry streaming with event-driven architecture, hardened API backend (Python/FastAPI), and established CI/CD across repositories.

Principal Engineer, Istari Digital

Feb 2024 - Jul 2025 · New York, NY

Istari Digital enables zero-trust digital collaboration for cyber-physical systems, connecting engineering tools to enable programmatic and AI-assisted automation of digital engineering workflows.

- Architected cryptographically verified asset lineage system and DoD-compliant control tagging to preserve dependencies, provenance, and tooling metadata without exposing sensitive payloads—enabling zero-knowledge collaboration, data sovereignty, and frictionless sharing. Embedded regulatory and audit readiness into technical patterns from inception.
- Led cross-functional team building secure backend registry service (Python, FastAPI, SQLAlchemy, PostgreSQL, Zanzibar, Authzed) and SDK. Designed database schema for asset relationships and metadata, tuned queries for complex lineage traversal, and managed zero-downtime migrations. Cryptographic core written in Rust with bindings for Python and WebAssembly.
- Partnered with InfoSec and compliance teams to ensure CI/CD validated all compliance requirements on each release, publishing results for ATO (Authority to Operate) submission to minimize approval effort for deployment on secure and classified networks. Designed systems that comply with regulatory frameworks from day one.
- Delivered all major milestones on time and successfully relaunched product for commercial and government clients. Served as trusted technical advisor across security, risk, and delivery teams.

Director of Software Development, Raytheon Technologies

Sep 2021 - Nov 2023 · New York, NY

Led development of next-generation data platform for aerospace applications at Enterprise Data Services (formerly UTC Digital Accelerator). Served as force multiplier across multiple engineering organizations, driving reuse and reducing duplication.

- Technical lead for pathfinder initiatives building real-time flight telemetry pipelines for Pratt & Whitney commercial jet engines. Built streaming data platform (Databricks, Spark, Python) processing thousands of engine sensors through fault detection and anomaly detection models, triggering severity-based automated alerts from emergency grounding to routine inspection scheduling.

- Designed ML model training and orchestration pipeline with comprehensive audit trails tracing every output field back to specific code revisions or model versions—ensuring auditability and regulatory compliance for safety-critical systems. Implemented threat modeling and architectural risk analysis to identify and remediate risk vectors before production deployment.
- Evangelized technical excellence through "inner-source" code addressing common problems: SDKs for parsing proprietary engine data formats, quickstart kits for Databricks projects, and synthetic data generators. Drove measurable uplift in developer productivity and time-to-market.
- Led team of 14 developers across three agile projects while supervising onboarding resources and migration support for 40+ teams adopting the new Databricks platform. Influenced governance policy and engineering standards across the enterprise.

Head of Technology, Dayforward

Jan 2020 - Sep 2021 · New York, NY

Head of technology for a life-insurance startup operating under strict regulatory oversight. Led technical strategy and development for algorithmic underwriting and policy-management platform in compliance with state insurance regulators.

- Architected and delivered cloud-native platform (Go microservices on Kubernetes, federated GraphQL API, Vue.js frontend) that launched same day the company received regulatory approval—demonstrating ability to ship resilient, secure systems that comply with regulatory frameworks from inception.
- Partnered with legal, compliance, and operations teams to translate control frameworks into actionable engineering guidance. Designed systems with embedded observability patterns and security controls to meet audit requirements.
- Led team through complete development lifecycle from architecture design through production deployment in under ten months, balancing innovation velocity with risk-mitigated execution.

Director of Software Engineering, UTC Aerospace Systems

Feb 2019 - Jan 2020 · Brooklyn, NY

Managed team of 17 engineers at UTC Digital Accelerator. Oversaw multiple project teams—from IoT sensors and mobile apps for industrial refrigeration to standardized design systems and developer tools. Led efforts to normalize, document, and evangelize engineering processes, standards, and best practices across the organization.

Lead Engineer / Chief Technologist, Riverdrop

Jan 2018 - Feb 2019 · New York, NY

Served as chief technologist for early-stage startup and led team building specialized product search engine.

- Designed and implemented ML-driven ETL pipeline (Python, spaCy, NLTK, scikit-learn) with image recognition models on AWS SageMaker. Built asynchronous event-driven processing using AWS SQS/SNS with DynamoDB for metadata storage, implementing retry logic, dead-letter queues, and idempotency for reliable processing.
- Architected system as microservices with discrete transformation steps, each packaged as Docker images and deployed via CI/CD to Kubernetes (built and managed with Terraform). Established observability patterns and operational maturity practices.

Director of Engineering (Mobile), MediData

Feb 2017 - Jan 2018 · New York, NY

Led engineering teams for Patient Cloud platform collecting clinical trial data from patients and clinicians via mobile devices and wearable sensors—operating under FDA regulatory requirements and HIPAA compliance.

- Managed products including ePRO (iOS/Android patient outcomes), Patient Cloud (iOS clinician outcomes), AppConnect (native SDK), Sensor Link (wearables platform), and supporting backend. Launched two major mobile initiatives and migrated all native development to Swift and Kotlin.
- Instituted organizational and process improvements that increased average team velocity by 2.5× while maintaining code quality and regulatory compliance through disciplined SDLC practices.

Principal Architect / Director of Mobile, Huge

May 2013 - Feb 2017 · Brooklyn, NY

- Led cross-functional team of 20+ iOS, Android, and backend engineers, QA analysts, designers, and product managers. Evangelized agile best practices, continuous integration, and continuous delivery across the organization.
- Instituted engineering guild system for cross-office knowledge sharing and formal sponsorship of guild-proposed R&D initiatives. One guild-led initiative generated new product proposal that secured $5M development contract.

- Championed innovation through new technology investigations, engineering blog, meetups, and open-source contributions. Directed notable client projects including smart Bluetooth audio/video accessories with live streaming, companion app for AAA game publisher, and numerous B2B and B2C mobile commerce applications.

Manager of Mobile Technology, Consumer Reports

Jul 2011 - May 2013 · Yonkers, NY

Founded mobile applications group and built in-house team for iOS/Android development. Developed and launched flagship ratings application and managed external vendors maintaining portfolio of legacy apps.

Senior Software Engineer – iTunes Store Video Workflow Group, Apple

Mar 2008 - May 2011 · Cupertino, CA

Senior engineer on team responsible for encoding and assembling all iTunes video media. Owned encoding toolchain used by processing cluster, specified deliverable media formats, developed validation test suites, and created reference media for hardware compliance testing. Led two major workflow rewrites for HDTV launch and international video expansion.

Senior Software Architect, The New York Times

Aug 2007 - Mar 2008 · New York, NY

Created tools for managing releases and production deployment. Oversaw offshore CMS development.

Founder, Partner, Bangstate

Jun 1999 - Mar 2008 · New York, NY

Founded and managed five-person development consultancy. Oversaw business and delivered projects for clients including The Associated Press, American Bar Association, Atlantic Records, Forbes Magazine, CIR/SEIU, and Time Inc.

Education

Bachelor of Arts in History, The University of Chicago

Chicago, IL