

Michael L. Welles

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Overview

Hands-on engineering leader with decades of experience building distributed systems, infrastructure, and developer tools. Strong background in Rust, Python, and TypeScript with expertise in high-performance asynchronous systems, cross-language SDKs, and multi-cloud deployments. Proven track record in founding-level roles shaping technical direction and team culture from day one. Built safety-critical and mission-critical infrastructure at high velocity while maintaining code quality through pragmatic CI/CD, observability, and disciplined SDLC practices.

Core Technologies

Languages & Frameworks: Rust, Python, Go, TypeScript, Swift, Kotlin, Java **Distributed Systems:** Message queues, pub/sub, event-driven architecture, async/concurrent processing, idempotency, retry/backoff **Data & Databases:** PostgreSQL, DynamoDB, Elasticsearch, Databricks, Spark **Cloud & Infrastructure:** Kubernetes, Docker, AWS (SQS/SNS, S3, IAM, VPC, SageMaker), Azure, Terraform, multi-cloud/hybrid deployments **Reliability & Observability:** CI/CD, distributed tracing, metrics/logging, SLOs/alerting, incident response

Experience

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.

- Led team building secure backend registry service (Python, FastAPI, SQLAlchemy, PostgreSQL) and cross-language SDKs. Cryptographic core written in Rust with bindings for Python and WebAssembly, wrapped by Python and TypeScript SDKs for automation agents and frontend.
- Designed cryptographically verified asset lineage and DoD-compliant control tagging—enabling zero-knowledge collaboration, data sovereignty, and frictionless sharing. Implemented high-performance async systems for real-time permissions control and observability over distributed agents.
- Architected hybrid, multi-cloud, and on-prem deployments tailored to customer needs. Ensured CI/CD validated all compliance requirements on each release, publishing results for ATO submission to minimize approval effort for deployment on secure and classified networks.
- Shaped technical direction and product strategy as founding-level engineer. Delivered all major milestones on time and successfully relaunched product for commercial and government clients.

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.

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.

- Technical lead building real-time flight telemetry pipelines for 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.
- Designed ML model training and orchestration pipeline with comprehensive audit trails. Implemented parallel evaluation of multiple models without adding latency using asynchronous patterns and concurrent processing.
- Led effort to "inner-source" developer tools: SDKs for parsing proprietary data formats, quickstart kits for Databricks projects, and synthetic data generators.
- Led team of 14 developers across three agile projects while supervising platform migration support for 40+ teams.

Head of Technology, Dayforward

Jan 2020 - Sep 2021 · New York, NY

Head of technology and development lead for a life-insurance startup. Led small team that designed and built the company's algorithmic underwriting and policy-management platform from day one.

- Built platform with Go microservices on Kubernetes, federated GraphQL API, and Vue.js frontend. Initial development completed in under ten months, launching the same day the company received regulatory approval.
- Shaped technical direction and team culture in founding-level role. Partnered closely with product and operations to compress build-ship-iterate loop.

Director of Software Engineering, UTC Aerospace Systems

Feb 2019 - Jan 2020 · Brooklyn, NY

Managed team of 17 engineers at the 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.

Lead Engineer / Chief Technologist, Riverdrop

Jan 2018 - Feb 2019 · New York, NY

Chief technologist for early-stage startup. Led team of three senior engineers to build specialized product search engine.

- Designed ML-driven ETL pipeline (Python, spaCy, NLTK, scikit-learn) for product identification and NLP-based entity extraction, with image recognition and classification models on AWS SageMaker.
- Built asynchronous data flow using AWS SQS/SNS for event-driven processing with DynamoDB for metadata storage, implementing retry logic, dead-letter queues, and idempotency for reliable processing. Developed search API in Go against Elasticsearch indexes and React.js/TypeScript frontend.
- 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).

Director of Engineering (Mobile), MediData

Feb 2017 - Jan 2018 · New York, NY

Led engineering teams responsible for the Patient Cloud platform, which collects clinical trial data directly from patients and clinicians via mobile devices and wearable sensors.

- 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×.

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.
- Instituted engineering guild system for cross-office knowledge sharing and formal sponsorship of guild-proposed R&D initiatives. One guild-led initiative generated a new product proposal that secured a \$5M development contract.
- Championed innovation through new technology investigations, engineering blog, meetups, and open-source contributions.

Senior Software Engineer – iTunes Store Video Workflow Group, Apple

Mar 2008 - May 2011 · Cupertino, CA

Senior engineer on a team of five responsible for encoding and assembling all iTunes video media. Owned the encoding toolchain used by the 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.

Education

Bachelor of Arts in History, The University of Chicago

Chicago, IL